vision

Alberta

species at risk

PROGRAM AND PROJECTS

2000-2001

Alberta
SUSTAINABLE RESOURCE DEVELOPMENT

Alberta Species at Risk PROGRAM AND PROJECTS 2000-2001

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acknowledgements

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executive summary

The Alberta Species at Risk program has a broad mandate that includes determining the status of wild species, identifying, protecting and providing for the recovery of species at risk, and preventing other species from becoming at risk.

A key component of the success of the program is collaboration with numerous partners, including other levels of government, scientific and funding agencies, and stakeholders. One of the most significant developments in the integration of conservation and wildlife management strategies in recent years was the signing of the Accord for the Protection of Species at Risk in Canada by federal, provincial and territorial Ministers responsible for wildlife. The goal of the Accord is to prevent species in Canada from becoming extinct as a consequence of human activity.

The Fish and Wildlife Division, Alberta Sustainable Resource Development has significantly expanded its Species at Risk program in recent years, as part of its commitment to the Accord. The Alberta Endangered Species Conservation Committee and Scientific Subcommittee have been established to provide guidance on status assessment and the legal designation of species at risk. Increased emphasis has been placed on recovery programs, and additional species groups, including plants, invertebrates and fish, can now be listed as *Endangered* or *Threatened* under Alberta's *Wildlife Act*. In response to the expanded scope of the program, enhanced funding in 2000-2001 was used to facilitate program delivery. New staff were hired to develop and deliver projects at the regional level, and to provide central program co-ordination and enhanced data management support.

In 2000-2001, funds were provided to 57 projects that covered a diversity of topics and taxa, including the development of communication and resource tools, as well as projects on amphibian, bird, fish, mammal, reptile and plant species. Many of these projects were provincial in scope and involved multi-regional collaboration. Approximately 41% of the 2000-2001 project funds were directed to initiatives that focused on *Endangered* or *Threatened* species. A similar level of funding (40%) was directed to projects that targeted species ranked as *Sensitive, May Be At Risk, Special Concern* or *Data Deficient*. Communication and resource tool development initiatives received 14% of the project funding, and the remainder was allocated to projects involving species ranked as status *Undetermined* or considered to be of particular management concern.

Project funding was prioritized based on the status of the target species, the urgency or importance of the proposed project and recommendations of the Alberta Endangered Species Conservation Committee. The range of projects contributed to advancement in all of the five key areas of the Species at Risk program: general status assessment, detailed status assessment, formal designation of *Endangered* and *Threatened* species, development and implementation of recovery programs for these species, and development and implementation of strategies to prevent species from becoming at risk.

A core focus of the Species at Risk program is the communication of results to fellow staff members, other departments and the public. As well as summarizing the accomplishments of the past fiscal year, this document introduces a new series of Species at Risk reports that will be available to other researchers and the public. This series of reports complements existing initiatives to share information, and highlights the significant advancements being made in species at risk management in Alberta. The program continues to provide invaluable information for local, regional, provincial and national species at risk initiatives.

northern leopard frog

102-01064/

introduction

Alberta's Species at Risk program was greatly expanded in 2000-2001, reflecting a commitment to deliver an enhanced and comprehensive program for the protection, management and recovery of species at risk. Recent changes to Alberta's *Wildlife Act*, along with Alberta's ongoing commitment to the Accord for the Protection of Species at Risk in Canada, have reaffirmed our responsibility for assessing the status of all taxonomic groups and developing recovery plans for all *Threatened* and *Endangered* species.

In response to these commitments, funding to the program was increased in fiscal year 2000-2001, allowing for the support of new staff, programs and projects. This document provides summaries of the 57 projects funded in whole or in part by the Species at Risk program in the past fiscal year. A diversity of topics and taxa were represented, including research on birds, fish, herpetiles (amphibians and reptiles), mammals and plants, as well as the development of protocols for future research, and various communication and resource tools.

The projects summarized in this document involved the participation of a great number of partner agencies that provided funding or in-kind support. Many of these collaborative partnerships were developed by the new regional Species at Risk staff and colleagues, who were also responsible for project management. Overall co-ordination of the program is the responsibility of the Resource Status and Assessment Branch, Fish and Wildlife Division, Alberta Sustainable Resource Development, in Edmonton.

The purpose of this document is to share information on the program for 2000-2001 with our staff, other departments and the public. It is the first in our new annual series of Species at Risk reports, and will act as a long-term record of program accomplishments.

Alberta's Species at Risk Program

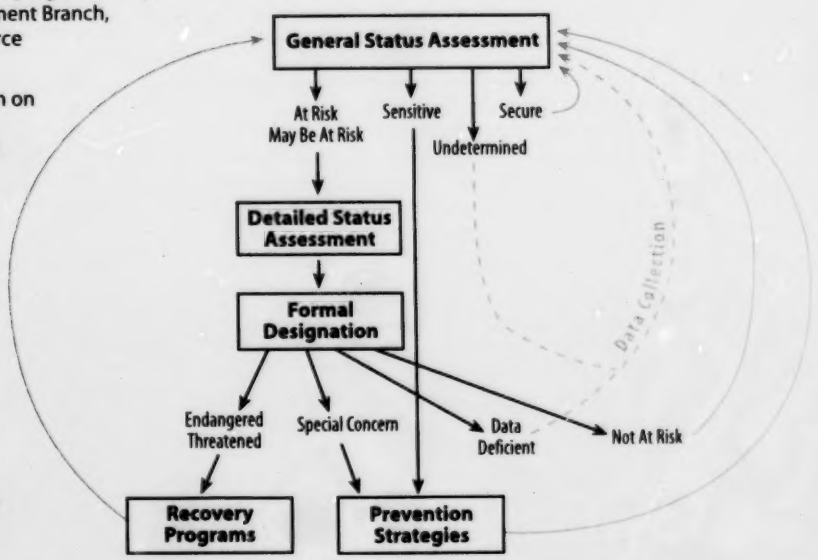
The Fish and Wildlife Division and its precursors have had a mandate to manage and conserve fish and wildlife resources in Alberta for well over 100 years. This role began in 1883, when Alberta was still part of the Northwest Territories, and annual harvest limits were needed for certain game species. Regulatory actions remained the focus of the Division's precursors until 1962, when the Fish and Wildlife Division was established and a stronger emphasis was placed on biological assessment and conservation. This new focus was reinforced in 1982 with the creation of the first *Fish and Wildlife Policy for Alberta*.

Several of the key principles outlined in the Fish and Wildlife Policy are that the Government will maintain wildlife populations and protect them from severe decline, and that the Minister of Sustainable Resource Development will make a periodic declaration on the status of Alberta's wildlife. Our Species at Risk program addresses and expands upon these commitments, focusing on identifying, protecting and providing for the recovery of species at risk, as well as preparing reports on both the general and detailed status of Alberta's wild species on a regular basis. Frequent updates of a species' status are essential to identify trends in population, provide early warning of species that may become at risk, and evaluate the success of recovery and prevention programs.

The Species at Risk program includes five key, integrated areas:

- assessing the general status of all wild species,
- detailed status assessment of species that may be at risk of extinction/extirpation,
- formal designation of *Endangered*, *Threatened* and *Special Concern* species,
- development and implementation of conservation recovery programs for these species, and
- development and implementation of strategies to prevent species from becoming at risk.

All of these components are essential and are linked to each other: assessment leads to designation, which leads to recovery and prevention programs. Evaluations of these programs feed back into the assessment process. Details on the five steps follow, and are illustrated in the accompanying figure.



1) General Status Assessment

This is the common link for all species in the process. The general status of wild species in Alberta, regardless of designation, is evaluated every five years. This process acts as a coarse filter, identifying those species that require more focused attention, either for protection or accurate evaluation. This exercise has expanded in scope, and preliminary status assessments were prepared for 4735 plant, vertebrate, invertebrate and fungi species. *The General Status of Alberta Wild Species 2000* (2001) reports on butterflies, orchids, ferns and fish as well as birds, mammals, and herpetiles, all of which were also assessed nationally in 2000.

2) Detailed Status Assessment

Detailed status reports, which provide a comprehensive and current summary of a species' status, are prepared for *At Risk*, *May Be At Risk* and some status *Undetermined* species. Using these reports, and any additional pertinent information, an independent body of scientists, the Scientific Subcommittee (SSC) of the Alberta Endangered Species Conservation Committee (ESCC), makes detailed assessments of species at risk, using criteria developed by the World Conservation Union (IUCN). The SCC provides these results, as well as recommendations for conservation, to the ESCC. The SSC and the ESCC were created in 1998 under Alberta's *Wildlife Act*.

3) Formal Designation

The ESCC, a broad stakeholder group including scientists, government and corporate land managers, resource-based land users and conservation organizations, then evaluates the status assessment and makes recommendations on legal designation, preparation of a recovery plan, and conservation actions that should be undertaken immediately. These recommendations and the SSC assessment are forwarded to the Minister of Sustainable Resource Development, who has the final responsibility for legally designating species as *Endangered* or *Threatened*, and initiating recovery and conservation measures. Legal designation as *Endangered* or *Threatened* under Alberta's *Wildlife Act* prohibits disturbance, killing or trafficking of these species, and provides immediate protection for nests and dens. For species that do not meet the criteria for *Endangered* or *Threatened*, new categories are being developed, including *Special Concern*, *Data Deficient* and *Not At Risk*.

4) Recovery Programs

Legally protected species then enter the formal recovery planning process. The focus of a recovery program is to improve the status of the species and ensure its long-term survival in the wild, with the ultimate goal of removing the species from the endangered species list. A formal Recovery Team is formed to develop and implement a recovery plan for the species. Following legal designation, recovery plans are required within one year for *Endangered*, and within two years for *Threatened* species.

5) Prevention Strategies

As it is generally much more efficient and cost-effective to protect species before they reach the point of needing recovery plans, any species designated as *Special Concern* following detailed status evaluation, or *Sensitive* following general status evaluation, becomes eligible for special management actions designed to prevent the species from becoming at risk. Biodiversity and ecosystem management are considered fundamental aspects of program delivery.

Also critical to this process is support from a data management team. This team has developed information management systems which provide standard platforms for gathering and storing relevant information on fish and wildlife species in Alberta. These systems facilitate the sharing and retrieval of data while providing a secure storage system for this valuable information. The data management team is currently working toward an integrated system for both fish and wildlife data (FWMIS, the Fish and Wildlife Management Information System), which will incorporate the Biodiversity/Species Observation Database (BSOD) and the Fisheries Management Information System (FMIS). A Geographic Information System (GIS) tool that will spatially display resource data is also being developed.

Provincial and National Program Integration

The Alberta Species at Risk program contributes to and complements other regional and national programs, and forms part of a comprehensive national strategy. As yet there is no federal legal designation process; however, species are evaluated and listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). This body of government and non-government scientific experts was created in 1977 to determine the detailed national status of wild Canadian species, subspecies and individual populations suspected of being at risk. COSEWIC is recognized nationally as a key source of independent scientific advice on the status of wild species in Canada, and uses information collected at regional and provincial levels to make its assessments.

The establishment of COSEWIC reflected the reality that species do not recognize jurisdictional boundaries and that the co-operation of various levels of government is critical to the conservation and protection of species at risk. This approach was further reinforced in 1996 with the signing of the Accord for the Protection of Species at Risk in Canada by federal, provincial and territorial Ministers responsible for wildlife. The goal of the Accord is to prevent species in Canada from becoming extinct as a consequence of human activity. The Accord also stipulates that a lack of scientific certainty will not be used as a reason to delay measures designed to prevent or minimize threats to species at risk.

One of the recent initiatives in which Alberta has taken a leadership role is the development and implementation of a national general statusing system. This initiative links directly to Alberta's general statusing effort, and to one of the commitments made in the Accord for the Protection of Species at Risk. A standard assessment protocol has been developed and adopted by all jurisdictions in Canada. This protocol will help consolidate the provincial and territorial status ranks of all wild species into national ranks at five-year intervals.

At the recovery level, Alberta participates on all national recovery teams for species that occur in the province. National recovery strategies and action plans are prepared under the auspices of the Recovery of Nationally Endangered Wildlife (RENEW) program. Teams consist of representatives from the jurisdictions where the species is found, other species experts, and stakeholders. The RENEW program was launched in 1988 and is currently being reviewed and updated with an emphasis on recovery actions. Provincial and national recovery plans will be developed to complement each other.

From the general statusing process to the establishment of the

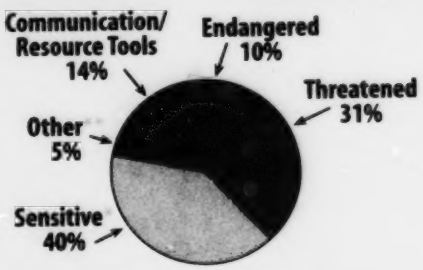
ESCC and SCC and the development of species recovery plans, Alberta continues to demonstrate, through the Species at Risk program, its commitment to the Accord for the Protection of Species at Risk. Additionally, with recent amendments to Regulations under Alberta's *Wildlife Act,* plants, invertebrates and fish can now be designated as *Endangered* or *Threatened*. The Species at Risk program continues to evolve, making advancements in all program areas.

Project Priorities for 2000-2001

The 2000-2001 Species at Risk provincial budget of $2.2 million was allocated to operations, data management and species at risk projects. Funds were allocated to projects based on a critical evaluation and ranking of all proposals using a pre-defined prioritization scheme and considering recommendations from the ESCC. Priority was placed on the status of the target species (*Endangered/Threatened* vs *Special Concern/May Be At Risk* vs *Sensitive*/other), and the urgency or importance of the proposed project (e.g., relating to existing commitments or offering direct/indirect conservation benefits). Additionally, species specialist groups for three species of particular management concern—grizzly bear, bull trout and woodland caribou—provided guidance on the relative priority of proposals received for those species.

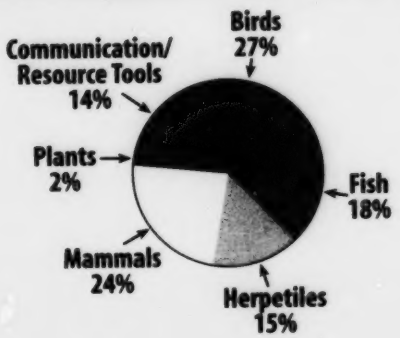
Approximately $1 020 000 was allocated directly to species at risk projects. The accompanying two charts show the breakdown of funds by risk category and by taxon. The communication/resource tool category appears in both graphs, as these projects do not fall into a single risk category or taxon.

Percentage of Project Funds Directed to Risk Level



Includes special concern, may be at risk, sensitive, data deficient
Includes secure, undetermined

Percentage of Project Funds Directed to Taxon



Communication Initiatives

Details on the projects summarized here are intended to be shared with other staff, the public, and stakeholders. Communication of the intent and results of these projects forms an important component of our public education/outreach mandate, and demonstrates the wide diversity of our program, as well as the progress being made on the monitoring, management and recovery of species at risk. The project summaries also identify priorities for future research.

All of the 57 projects funded in whole or in part by the Species at Risk program are summarized in the body of this document. The summaries are arranged by taxon, in alphabetical order by species, with a final section on projects dealing with communication or resource tools. Each summary begins with information on the nature of the project, location and project supervisor (Fish and Wildlife Division staff unless otherwise noted), as well as the target species, their legal designation under Alberta's *Wildlife Act* and their general status. Information on species' status was obtained from *The General Status of Alberta Wild Species 2000* (2001) and the *First Report of the Alberta Endangered Species Conservation Committee* (2000). This introductory information is followed by brief sections summarizing the background, purpose, methods, results and recommendations/future direction of the project, as well as contact information and availability of a report. A list of literature cited follows the project summaries.

This document includes detailed contact information for Species at Risk staff, and a map of regional boundaries that also displays the location of Species at Risk staff throughout the province. A list of partners follows these pages, identifying agencies that provided funding or in-kind support for the species at risk projects. We have attempted to make this list complete, but apologize in advance if any agencies were omitted. Definitions of species at risk terms, a list of related references, an index of the common names of species occurring in the summaries, an index of projects by regions in which they occurred, and a list of titles in this report series are included at the end of this document.

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cooperating agencies

The projects included in this document received in-kind and financial support from the following:

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Alberta Agriculture, Food and Rural Development - Public Lands Division

Alberta Conservation Association

Alberta Ecotrust

Alberta Environment – Environmental Services

Alberta Environment – Land and Forest Service

Alberta Environment – Parks and Protected Areas

Alberta Environment – Resource Data Division

Alberta Native Plant Council

Alberta Natural Heritage Information Centre

Alberta Newsprint

Alberta North American Waterfowl Management Plan

Alberta-Pacific Forest Industries

Alberta Research Council

Alberta Sport, Recreation, Parks and Wildlife Foundation

Beaverhill Bird Observatory

Boreal Caribou Research Program

Bow Valley Provincial Park

Calgary Zoo

Canada Trust Friends of the Environment Foundation

Canadian Forces Base Suffield

Canadian Institute of Resources Law (University of Calgary)

Canadian Wildlife Service

Canfor

Cardinal River Coals

Concordia University College of Alberta

Cooperative Fisheries Inventory Program

Department of Fisheries and Oceans Canada

Diashowa-Marubeni International

Dinosaur Provincial Park

Ducks Unlimited

Eastern Irrigation District

Endangered Species Recovery Fund

Foothills Model Forest

Friends of Elk Island Society

Grasslands National Park

Gregg River Resource

Inland Cement

Jasper National Park

Kananaskis Field Station

Luscar

Manning Diversified Forest Products

Montana Department of Fish, Wildlife and Parks

National Burrowing Owl Recovery Team

Natural Sciences and Engineering Research Council of Canada

Nature Conservancy of Canada

Operation Grassland Community

Parks Canada

Petro-Canada

Prairie Farm Rehabilitation Administration

Provincial Museum of Alberta

Rocky Mountain Elk Foundation

Saskatchewan Environment and Resource Management

Scientia Technologies

Southwestern Alberta Grizzly Strategy (Alberta Conservation Association)

Student Career Placement Program

Summer Temporary Employment Program

Sundance Forest Products

Sunpine Forest Products

Telemetry Solutions

TransCanada Pipelines

University of Alberta

University of Calgary

University of Saskatchewan

University of Szczecin, Poland

W.A. Switzer Provincial Park

Waterton Lakes National Park

Weldwood of Canada

West-Central Alberta Caribou Standing Committee

Weyerhaeuser Canada

Wildlife Preservation Trust Canada

Significant cooperation was also received from a number of natural resource industries, local ranches and private landowners.

PROVINCIAL GOVERNMENT DEPARTMENT NAMES REFLECT GOVERNMENT ORGANIZATION IN 2000-2001.

birds

BURROWING OWL SURVEY AND MONITORING – BROOKS AREA, HANNA AREA

Project Supervisor: **Reg Russell**

purpose | To determine the population status of the burrowing owl in the Brooks and Hanna areas.

Background

The burrowing owl occurs in Alberta during the summer months, breeding throughout the mixed-grass and dry mixed-grass ecoregions in the southeastern part of the province. This species may also occur to the north and west of these ecoregions into the Parkland Region. The burrowing owl inhabits treeless plains with sparse vegetation, and requires abandoned ground squirrel or badger excavations for nests and shelter.

Population surveys suggest that the Alberta population has declined by approximately 30% over a 10-year period. The breeding population in Alberta is currently estimated to be fewer than 800 pairs, compared with estimates of over 1500 pairs in 1978, and approximately 1000 pairs in 1990.

Although the exact causes of the population decline are unknown, possible limiting factors include a decreased availability of burrows due to reductions of burrowing mammal populations, and increased predator numbers. Suitable grassland habitat was converted rapidly for cultivation from 1976-1986, and although this conversion ended over a decade ago, burrowing owls continue to decline. In addition, this species is an obligate neotropical migrant, and may be affected by habitat alteration on its migration and/or wintering range.

Methods

The Biodiversity/Species Observation Database (BSOD) was used to identify prime areas for searching and monitoring. Known nesting sites in the Brooks area and Eastern Irrigation District were revisited and monitored, and other sites, including the Pollockville and Cressford area, were searched for new nests or nesting areas. Surveys were repeated in the K-Blocks (160 quarter-sections) near Brooks and the Hanna Blocks (108 quarter-sections) using standardized protocol procedures for burrowing owl call/response.

All observations, including Global Positioning System (GPS) locations and associated relevant information, were entered into the Biodiversity/ Species Observation Database (BSOD).

Results

Key findings were as follows:

K-Block searches:

- All 160 quarter-sections were searched
- 18 owls were observed
- 16 owls were inside blocks
- 12 locations were found
- 10 locations were inside blocks, only 9 proved to be nest sites
- 45 young were observed in productivity searches (average 5.0)
- 6 new nest sites were marked
- 6 nests used in 1999 were reused in 2000
- 1 known nest site was missed during the survey (for the 3rd time)
- K-Block population appears relatively stable, 8.7 nests per 100 km^2

H-Block searches:

- Only 76 out of 109 quarter-sections were searched (access denied on 33)
- 4 owls were observed
- 4 owls were inside block
- 2 locations were found inside block
- 10 young were observed in productivity searches (average 5.0)
- 2 new nest sites were marked
- survey was not conducted in 1999
- 2 known nest sites were missed during the survey
- H-Block population is declining, 4.1 nests per 100 km^2

Recommendations/Future Direction

The survey should be repeated in 2001 with cultivated blocks eliminated from the H-Block surveys. In addition, historical nest sites should be checked before observers leave the area.

More biological and geographical information on the trend blocks needs to be collected, and ArcView/BSOD GIS themes for K- and H-Blocks should be developed. Observations of Richardson's ground squirrel and other species should also be recorded and evaluated.

REGION:
Provincial (conducted in Bow)

TARGET SPECIES:
Burrowing Owl (*Athene cunicularia*)

WILDLIFE ACT CATEGORY:
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

COOPERATING AGENCIES

Operation Grassland Community, National Burrowing Owl Recovery Team, Eastern Irrigation District

For more information contact:

Arlen Todd *(see page 5)* and see Species at Risk Report No. 8, Burrowing owl trend block survey and monitoring – Brooks and Hanna areas.

FERRUGINOUS HAWK MONITORING

Project Supervisor: **Gary Erickson, Gordon Court**

REGION:
Provincial (conducted in Prairie, Bow)

TARGET SPECIES:
Ferruginous Hawk *(Buteo regalis)*

WILDLIFE ACT CATEGORY:
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

None

For more information contact:

Gordon Court *(see page 5)* and see Species at Risk Report (in prep.), An evaluation of the ferruginous hawk population in Alberta based on recent trend data.

purpose

To estimate the ferruginous hawk population size and habitat changes in Alberta.

Background

In Alberta, the ferruginous hawk occurs primarily in areas with at least 50% natural grassland that support ground squirrel prey populations. The distribution of this species has been greatly reduced since European settlement. Estimates of range contraction include approximately 40% reduction in Alberta and 50% across Canada. Although population levels are thought to have declined by at least 50% since the 1920s, current population levels in Alberta are thought to have stabilized.

Threats to this species include human disturbance, road kills, shootings, soil cultivation, and expansion of forests into grasslands as a result of fire suppression. Ferruginous hawk populations also fluctuate with the availability of prey, particularly the Richardson's ground squirrel.

Although this species is not in immediate danger of extirpation in Alberta, monitoring of known nesting areas and prey populations is essential in order to assess population trends and potential limiting factors.

Methods

In 1982, a ferruginous hawk monitoring survey was established in southern Alberta, with the intention of monitoring ferruginous hawk populations over time. A total of 80 plots (each 41.4 km^2 in size) were surveyed for hawk nests, presence of adults and presence of juveniles. This survey was repeated in 1987, 1992, and again in 2000. The number of plots was increased to 85 in 2000 within the same study area boundary. Monitoring on survey sample blocks was conducted using methods described by Schmutz (1982), with plots randomly placed across the landscape (and in the same locations as in the 1982 survey).

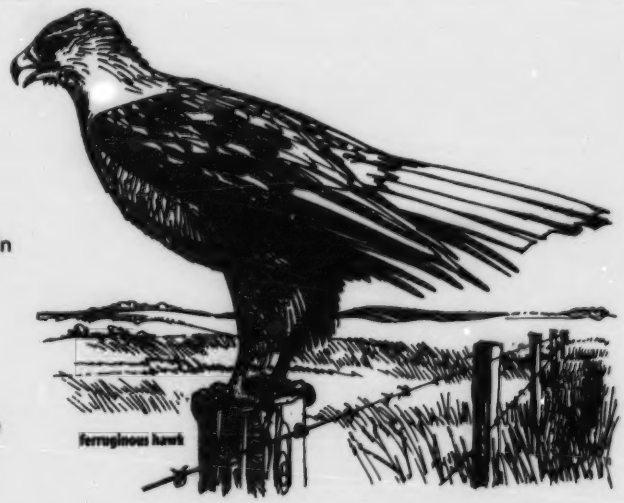
Field forms were completed with general vegetation cover and *Buteo* species observations. Data obtained in this study were entered into the Biodiversity/Species Observation Database (BSOD).

Results

The 2000 survey revealed low numbers of ferruginous hawk nests in southern Alberta (an estimated 731 nests), considerably lower than the 1992 estimate of 1702 nest sites. In an attempt to determine the cause of this decline, data from the 2000 survey were analyzed in relation to land use practices. There was no significant difference between the numbers of ferruginous hawk nests in each of four different ecoregions across the study area ($p=0.205$), and no significant difference between the numbers of ferruginous hawk nests in plots with oil and gas activity compared to those plots without oil and gas activity ($p=0.684$). As in previous surveys, plots with a greater percentage of cultivation had fewer ferruginous hawks. However, the total percentage of area under cultivation within the survey plots did not change between 1992 and 2000 (50.7% in 1992 and 49.9% in 2000), and thus could not explain the overall decline.

Recommendations/Future Direction

Other studies have shown ferruginous hawk populations to fluctuate in numbers, dependent on prey populations. The most logical explanation for the low numbers of ferruginous hawk nests observed in 2000 would be low numbers of ground squirrels; however, small mammal data were not collected during the 2000 survey, making it difficult to test this hypothesis. If managers wish to further address the concerns of ferruginous hawk population decline in southern Alberta, it is critical to establish a program to monitor ground squirrel populations, and continue with the ferruginous hawk monitoring surveys over time.



Ferruginous hawk

HARLEQUIN DUCK COOPERATIVE SURVEY

Project Supervisor: **Jeff Kneteman**

REGION:
Northern East Slopes

TARGET SPECIES:
Harlequin Duck (*Histrionicus histrionicus*)

WILDLIFE ACT CATEGORY:
Game Bird

PROVINCIAL GENERAL STATUS:
Sensitive

purpose

To estimate population size and productivity, and determine spring distribution and key breeding areas in major drainages of the Northern East Slopes Region.

Background

Harlequin ducks have a restricted distribution in Alberta, with breeding records limited to the Rocky Mountain and Foothills Natural Regions. Alberta represents the eastern limit of this species' Pacific population.

Although naturalist records appear to indicate a decline in the Jasper and Banff areas, populations appear stable along the Bow, Elbow and McLeod rivers.

Threats to harlequin ducks may include recreational activities that disturb breeding populations. This species uses fast-flowing mountain streams in forested habitats, which may increase its vulnerability to the effects of logging, mining and grazing on stream ecology. However, as most of Alberta's breeding population is located in protected mountain parks, these threats are reduced.

Study of this species in the Northern East Slopes Region will provide improved understanding of population status, distribution, productivity and relationship to proposed human activities. Survey technique development will also assist in the assessment of population presence, composition and productivity, and the ability to compare specific populations of interest to a broader population database.

Methods

Helicopter surveys were conducted on the McLeod, Sulphur, Berland, Muskeg, Wildhay and Muddywater-Fetherstonhaugh rivers and Sheep-Coté Creek in late May/early June.

Ground counts of harlequin duck broods were also conducted on the Sulphur, Berland and Wildhay rivers and Sheep-Coté Creek within Willmore Wilderness Park in order of priority as resources and time allowed.

Data obtained were entered into the Biodiversity/ Species Observation Database (BSOD).

Results

Preliminary results for this project indicate that spring numbers were relatively high in the McLeod-Whitehorse, Berland and Sulphur watersheds (≥ 40 birds per watershed), followed by the Muskeg, Sheep-Coté, Muddywater-Fetherstonhaugh, and Jackpine watersheds (≥ 15 birds per watershed). Relatively few birds were observed on the Smoky, Cardinal, Little Berland and Wildhay rivers, and Hardscrabble Creek (< 15 birds per watercourse). The number and distribution of birds were consistent across years for all previously surveyed watersheds except the Muskeg River, in which 15 more birds were seen in 1998 (23) than in 2000 (8).

During ground surveys in August 2000, two broods with 5 young each were observed on the West and South Sulphur rivers. Four broods (three with seven young, one with four young) were recorded on the South and North Berland rivers. During aerial surveys in September 2000, 4 broods (all with 4 young) were observed on the Sulphur River and 5 broods (total of 22 young) were observed on the Berland River. Unlike ground surveys, aerial surveys included the main stems of these rivers.

Based on aerial survey results, 18% of females observed in the spring produced broods on the Sulphur River compared with 23% on the Berland River. Female reproductive output (number of ducklings per number of females observed in spring) was 0.73 and 1.00 for the Sulphur and Berland watersheds, respectively. Productivity in these watersheds was, on average, lower than that reported for the McLeod-Whitehorse watershed and the Kananaskis and Elbow rivers in Kananaskis Country, but was higher than on the Bow River in Banff National Park.

Recommendations/Future Direction

The following recommendations are not listed in order of priority:

1) Aerial surveys should continue in the McLeod-Whitehorse watershed, the Cardinal River, and the 10 watersheds previously surveyed in Willmore Wilderness Park. These surveys should occur annually in the McLeod-Whitehorse watershed and every two to three years in the remaining watersheds. All surveys should use consistent stream sections across years.
2) Aerial surveys should occur during breeding and brooding periods (late May-early June and August-September) to determine relative abundance, population trends, distribution and productivity. Additional aerial and ground surveys should be conducted in August,

approximately three weeks post-hatching, to assess hatching success.

3) Within a given year, streams should be flown more than once during breeding and brooding periods to determine within-year variance associated with aerial survey results and to obtain population estimates. Should funding permit, multiple flights should also occur approximately three weeks after hatching.

4) Locations of observations from survey replicates of the same site should be analyzed for consistency of location and group size and composition to assist our understanding of the proportion of birds that are missed in surveys.

5) Early September brood assessments on the McLeod-Whitehorse watershed are required to render productivity estimates comparable to results available from the Bow, Elbow and Kananaskis rivers and the Willmore Wilderness Park area.

6) Further research in the McLeod-Whitehorse watershed and Willmore Wilderness Park should include an assessment of stream characteristics at duck observation sites using the WAM/HAGIS model (Watershed Assessment Model/Hydrological Attributes from Geographic Information System) and additional surveying of smaller streams. It is possible that changes in population size would be evident first in these small tributaries of lower quality habitat rather than in larger, higher quality rivers.

7) The raw data from ground surveys of the McLeod-Whitehorse watershed should be reviewed to determine the rate at which marked birds are observed more than once during the same survey on subsequent days or along different stream sections. If marked birds are recorded more than once in a survey, the number of unmarked birds should be adjusted by a similar ratio as well. This will improve the accuracy of survey counts and subsequent population estimates.

8) Differences between female breeding success estimates derived from radio-tagged females versus non-telemetry females, as noted by Smith (2000, pg. 46) and detected in data presented by MacCallum and Godsalve (2000 pg.10 and 12, table 2), should be assessed and interpreted.

Canadian Wildlife Service,
Alberta Conservation
Association

harlequin duck

For more information contact:

Lisa Wilkinson *(see page 5)* **and see Species at Risk Report No. 11, Harlequin duck monitoring in the Northern East Slopes of Alberta: 1998-2000 preliminary results.**

HARLEQUIN DUCK INVENTORY - BOW REGION

Project Supervisor: **Jon Jorgenson**

REGION:
Bow

TARGET SPECIES:
Harlequin Duck (*Histrionicus histrionicus*)

WILDLIFE ACT CATEGORY:
Game Bird

PROVINCIAL GENERAL STATUS:
Sensitive

purpose To develop a systematic monitoring plan for harlequin ducks in the Canmore area, and to collect status and distribution information on other river systems where no information currently exists.

Background

Harlequin ducks have a restricted distribution in Alberta, with breeding records limited to the Rocky Mountain and Foothills regions. Alberta represents the eastern limit of this species' Pacific population.

Although naturalist records appear to indicate a decline in the Jasper and Banff areas, populations appear stable along the Bow, Elbow and McLeod rivers.

Threats to harlequin ducks may include recreational activities that disturb breeding populations. This species uses fast-flowing mountain streams in forested habitats, which may increase its vulnerability to the effects of logging, mining and grazing on stream ecology. However, as most of Alberta's breeding population is located in protected mountain parks, these threats are reduced.

A comprehensive monitoring program that describes methods and locations for long-term monitoring of harlequin ducks on all primary streams in Kananaskis Country would provide better information to deal with the protective needs of this species.

Methods

Ducks were captured and banded on the Elbow and Kananaskis rivers, with periodic surveys conducted for marked/resighting population estimates. Streamside surveys of Sheep, Highwood, Ghost and Waiprous creeks were conducted. To assess productivity, brood surveys were also conducted.

Results

Two reports on harlequin duck monitoring from 2000 have been completed:

1. *Harlequin Duck Research in Kananaskis Country in 2000*

   This report describes the results of detailed monitoring on the Elbow River, Kananaskis River and Cataract Creek in the summer of 2000. It identifies population estimates, survival rates and production, and compares these results to similar monitoring done in previous years. Production continues to be higher on the Kananaskis River than on the Elbow River. Population estimates on the Elbow River (42 ± 11 SD) were similar to those from the previous 3 years. The estimate for the Kananaskis River was 71 (± 19 SD).

2. *Proposed Monitoring Plan for Harlequin Ducks in the Bow Region of Alberta*

   This report describes in detail a plan for determining and monitoring the status of harlequin ducks in the Bow Region. It describes the known breeding status of all potential rivers and streams in the region and outlines a timetable for inventory to determine the breeding status of populations on these water bodies. Alternate methodologies are described, as well as a statistical analysis of sampling effort required to detect trends.

Recommendations/Future Direction

It is recommended that the monitoring plan be used to determine and monitor harlequin duck status in the region, particularly for those streams for which harlequin duck presence is classified as "unknown" (one or two independent pair or female observations in the last 15 years) or "potential" (no observations on record but habitat may be suitable).

COOPERATING AGENCIES

None

For more information contact:

Arlen Todd *(see page 5)* and see Species at Risk Report No. 15, Harlequin duck research in Kananaskis Country in 2000, and No. 16, Proposed monitoring plan for harlequin duck in the Bow Region of Alberta.

HARLEQUIN DUCK MONITORING – PRAIRIE REGION

Project Supervisor: **Richard Quinlan**

REGION:
Prairie

TARGET SPECIES:
Harlequin Duck (*Histrionicus histrionicus*)

WILDLIFE ACT CATEGORY:
Game Bird

PROVINCIAL GENERAL STATUS:
Sensitive

purpose To acquire information on harlequin duck staging areas in the Oldman River drainage.

Background

Harlequin ducks have a restricted distribution in Alberta, with breeding records limited to the Rocky Mountain and Foothills Natural Regions. Alberta represents the eastern limit of this species' Pacific population.

Although naturalist records appear to indicate a decline in the Jasper and Banff areas, populations appear stable along the Bow, Elbow and McLeod rivers.

Threats to harlequin ducks may include recreational activities that disturb breeding populations. This species uses fast-flowing mountain streams in forested habitats, which may increase its vulnerability to the effects of logging, mining and grazing on stream ecology. However, as most of Alberta's breeding population is located in protected mountain parks, these threats are reduced.

A baseline inventory does not exist for harlequin ducks in Alberta. Information on spring staging areas in southern Alberta would be extremely useful in planning management strategies for this species.

Methods

An aerial survey was conducted of the Oldman and Castle rivers. The methods used were those previously employed in the Athabasca and North Saskatchewan river drainages. Ground-truthing was performed to develop a sightability index.

Results

Harlequin ducks appear to select the Oldman River as a staging area. A total of 27 ducks was observed on 17.4 km of stream, and included 24 ducks in 10 km of stream (2.4 ducks/km). Over the 17.4 km, this translates into a relative abundance of 0.63 pairs/km and 1.55 ducks/km. This section of river represents the highest concentration of harlequin ducks in the study area. Typically, harlequin ducks will congregate on staging areas, replenish body reserves, and move up adjacent tributaries or stay on the main stream to nest. Helicopter surveys confirmed this, with 67 percent of the ducks recorded on the Oldman River, 19 percent on the Livingstone River, <0.1 percent on Racehorse Creek and zero on Dutch Creek. Staging areas for the Oldman River drainage appear to be the lower section of the Livingstone River and along the Oldman River to Oldman Falls, where 86 percent of the birds were found on May 17, 2000.

During the first aerial surveys, few ducks were detected in the Castle drainage. For the second set of aerial surveys, efforts were focused on the Castle River drainage to investigate the possibility that surveys had been undertaken before staging had occurred. This did not appear to be the case, and the same number of ducks (four) was observed on the May survey as was detected on the June survey.

Harlequin ducks have been consistently reported on Lynx Creek (Norstrom and Clark 1998, Iwaasa and Taylor 2000). No ducks were found on the creek during May surveys, but 4 birds (1 pair, 1 lone female and 1 lone male) were counted in June. Subsequent brood surveys on Lynx Creek detected 2 females, each with 5 young.

Recommendations/Future Direction

It is recommended that helicopter surveys occur every five years. Ground surveys (for breeding and brooding harlequins) on the Oldman River and Carbondale River/Lynx Creek should continue each year to monitor relative annual abundances (birds/km). If ground surveys ever detect a significant downward trend over a number of years, helicopter surveys across the Oldman River basin would help to verify the trend. It is also important to identify nesting areas so that activities in these regions can be managed to reduce disturbance to the ducks during nesting and incubation. This could be accomplished by using radio telemetry to track females to their nesting sites.

Helicopter surveys in the Castle River drainage system failed to detect a major staging area. If the opportunity arose, it would be beneficial to conduct aerial or foot surveys of the Front Range streams such as Pincher Creek, Yarrow Creek and Waterton River. Each year, one or two previously unsurveyed streams should be investigated for breeding harlequin ducks. Standardization of surveys is critical and will allow comparison of data from many years. Future aerial and ground surveys should include the study areas delineated in Iwaasa and Taylor (2000), documenting ducks observed in each reach of stream as described in the methodology.

Monitoring of the Oldman basin population of harlequin ducks could make a significant contribution to our understanding of North American harlequin duck distribution and ecology. The Oldman River basin is one area of harlequin duck breeding range where mixing of ducks from a number of geographic areas could occur (J. Ashley pers. comm.). Leg banding of harlequin ducks would help to obtain quantitative demographic population data (reproduction, survival, emigration and immigration) necessary to monitor harlequin duck populations in the Oldman River basin.

Waterton Lakes National Park

For more information contact:

Richard Quinlan *(see page 5)* and see Species at Risk Report No. 20, Harlequin duck surveys of the Oldman River basin in 2000.

LOGGERHEAD SHRIKE INVENTORY AND STATUS

Project Supervisor: **Ron Bjorge, Dave Moore**

REGION:
Parkland

TARGET SPECIES:
Loggerhead Shrike (*Lanius ludovicianus*)

WILDLIFE ACT CATEGORY:
Non-game Animal
(ESCC recommendation: Special Concern)

PROVINCIAL GENERAL STATUS:
Sensitive

purpose

To identify and protect existing loggerhead shrike nest sites in the Parkland Region, and contribute to the status assessment of this species in western Canada.

Background

The loggerhead shrike's range has contracted in North America since the mid-1900s, to the point where it is now extirpated from most of eastern Canada and the northeastern United States. Its range has also contracted in the prairie provinces, and it has not been recorded recently in the Peace Parkland of Alberta although it occurred there during the 1950s.

The loggerhead shrike's population size has also decreased markedly, with Canadian populations showing a 10.1 percent annual decline in continental populations over the past 30 years, according to Breeding Bird Surveys. However, there is some evidence that these declines have stabilized in the past decade, and populations may now be increasing in some areas, including Alberta.

There are believed to be approximately 3000 breeding pairs of loggerhead shrikes currently in Alberta, with most occurring south and east of Stettler. Although population declines may have stabilized in recent years, populations in Alberta and elsewhere may still be affected by habitat loss on their breeding and wintering grounds as well as by toxic contaminants and human disturbance.

The Alberta Endangered Species Conservation Committee (ESCC) has recommended the loggerhead shrike be designated as *Special Concern*, meaning that it is a species that has characteristics that make it particularly sensitive to human activities or natural events.

Methods

Roadside surveys were conducted between Highway 36 and the Saskatchewan border, in a strip approximately 20-30 km wide along the southern edge of the Parkland Region. Surveys were conducted between dawn and 10 a.m., and after 4 p.m. (during the cooler parts of the day).

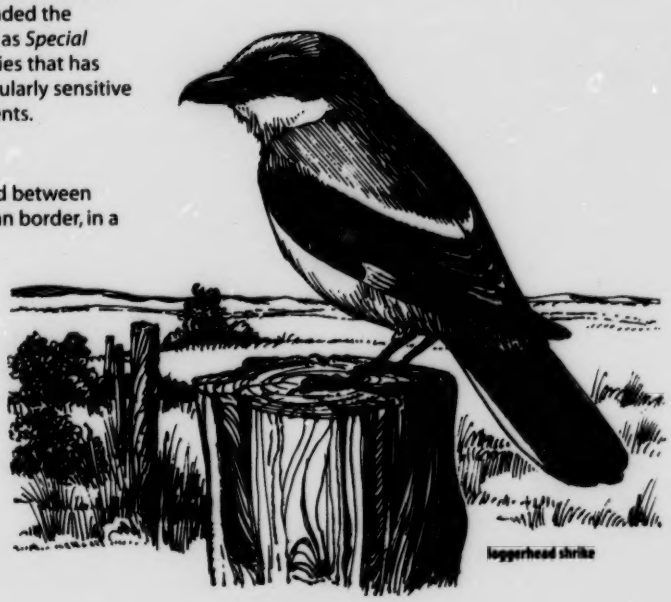
When a pair was found, a brief nest search was conducted. Tape playbacks were also used in some areas to locate birds. Locations of loggerhead shrikes and their nests, and information on the security of the nest sites were recorded. All observations were entered into the Biodiversity/Species Observation Database (BSOD).

Results

Eighteen pairs were found, including 4 with young. The birds were found in 2 main areas: between Provost and Czar, and between Castor/Coronation and Sullivan Lake.

Recommendations/Future Direction

The project should be continued in the coming year, including surveys and nest searches. Due to the low density of loggerhead shrikes, it is recommended that the surveys be expanded to cover a broader geographical area.



loggerhead shrike

COOPERATING AGENCIES

Canadian Wildlife Service

For more information contact:

David Prescott *(see page 5)*.

LONG-BILLED CURLEW RESEARCH PROJECT

Project Supervisor: **Richard Quinlan**

REGION:
Provincial (conducted in Prairie)

TARGET SPECIES:
Long-billed Curlew (*Numenius americanus*)

WILDLIFE ACT CATEGORY:
Non-game Animal
(ESCC recommendation: Special Concern)

PROVINCIAL GENERAL STATUS:
May Be At Risk

None

For more information contact:

Richard Quinlan *(see page 5)* and see Saunders, E. (in prep.) How many long-billed curlews in Alberta? A review of relevant literature and a sampling method for an inventory of long-billed curlews (*Numenius americanus*) in Alberta. (Interim report for Fish and Wildlife Division)

purpose

To determine the population status of the long-billed curlew in Alberta.

Background

The long-billed curlew inhabits large tracts of native prairie grassland. Long-term declines since the early 1900s are thought to have been caused by conversion of native grasslands to cropland, and overhunting. Continuing conversion of grassland to cropland, urban development, road and pipeline construction and pesticide use may also threaten the long-billed curlew's habitat.

The population in Alberta appears to be declining; however, insufficient data exist on this species to plan effective management strategies. To determine population size and long-term trends, a standardized inventory technique must be developed.

Methods

A review of the relevant literature and consultations with knowledgeable individuals were completed, and a provincial inventory design and protocol were prepared for implementation in 2001.

Results

Although the studies examined differed widely in terms of their objectives, there were several commonalities in the methods for sampling curlews and their close relatives:

1. To gain accurate population estimates, surveys should be undertaken during the incubation period.
2. Driving and stopping surveys have been found to be effective in estimating numbers of curlews adjacent to roads. An observation period of 3 to 5 minutes per stop was most commonly implemented.
3. Reduction of sampling variance is critical and can sometimes be achieved through stratification on the basis of habitat.
4. Although playing and/or imitating curlew calls to attract curlews was used in one study, others have found it to be ineffective.
5. Intensive "field by field" walking surveys have been found to be highly effective for estimating curlew populations in the United Kingdom. However, considering the sampling area in Alberta, such an intensive method would be impractical.

A proposed methodology for conducting an inventory of long-billed curlews in Alberta was also prepared, including information on sampling design, survey protocol, required resources, data analysis and recommendations for assessing long-term population trends.

Recommendations/Future Direction

The primary objective of the inventory to be carried out in 2001 is to estimate the population of long-billed curlews in Alberta to within 20 percent of the actual population. The methodology should also lend itself to being able to identify population trends over time, through future repetitions of the survey. A secondary objective is to sample other prairie species that can be easily observed and recorded within the sampling framework designed for curlews.

The curlew inventory will be conducted in the Grassland Natural Region. Transects will be established along roads or other rights-of-way as much as possible and surveys will be conducted by driving the transect and getting out of the vehicle to record data. In areas where roads are sparse, some transects will be conducted off-road using either quads or mountain bikes. Before the surveys are conducted, observers will drive the route and record habitat and Global Positioning System (GPS) data. Abundance information on six prairie bird species will be collected in sample units directly in conjunction with the curlew inventory. Occurrence information on an additional 16 prairie wildlife species will also be collected when observed both on and off of survey routes.

NORTHERN PYGMY-OWL INVENTORY

Project Supervisor: **Dave Prescott**

REGION:
Provincial (conducted in Bow, Parkland, Northern East Slopes)

TARGET SPECIES:
Northern Pygmy-owl
(*Glaucidium gnoma californicum*)

WILDLIFE ACT CATEGORY:
Bird of Prey

PROVINCIAL GENERAL STATUS:
Sensitive

purpose To survey for northern pygmy-owls throughout the undeveloped region of the central foothills.

Background

The northern pygmy-owl is a relatively uncommon species that has been infrequently recorded throughout the foothills and mountains of Alberta, with scattered records eastward through the southern boreal forest region. Like most small owls, the species is nocturnal and secretive. It is therefore not surprising that the natural history, distribution and abundance of the northern pygmy-owl are poorly known.

Northern pygmy-owls are secondary cavity nesters, relying on holes created by woodpeckers, fungal decay or insects. As this species prefers old-growth forests, logging in these forests may cause populations of the northern pygmy-owl to decline. However, more information is needed (current population size and trends) to determine any threats.

This project is the first concerted effort to survey pygmy-owls over a large part of their range in Alberta. The survey will provide critical information on population size and distribution, as well as habitat use, which will be required to properly classify the risk status of this species.

Methods

Nocturnal surveys covered the core portion of the pygmy-owl's range in Alberta. Surveys commenced around 1 March 2001, which corresponds to the onset of breeding activity in this species.

Survey points were randomly selected along accessible roads throughout the region. Each point was visited once between dusk and midnight by a team of two observers. The survey protocol was adapted from the Nocturnal Owl Monitoring Program, with a two-minute silent listening period followed by one minute of call playback and a second two-minute listening period.

Following the field surveys, all sample locations will be overlaid with Alberta Vegetation Inventory (AVI) data. AVI will be queried to yield habitat attribute data (e.g., dominant vegetation, age structure, understory structure) at two scales (200 m and 1000 m) around owl sample points.

All recorded pygmy-owl locations will be entered into the Biodiversity/Species Observation Database (BSOD).

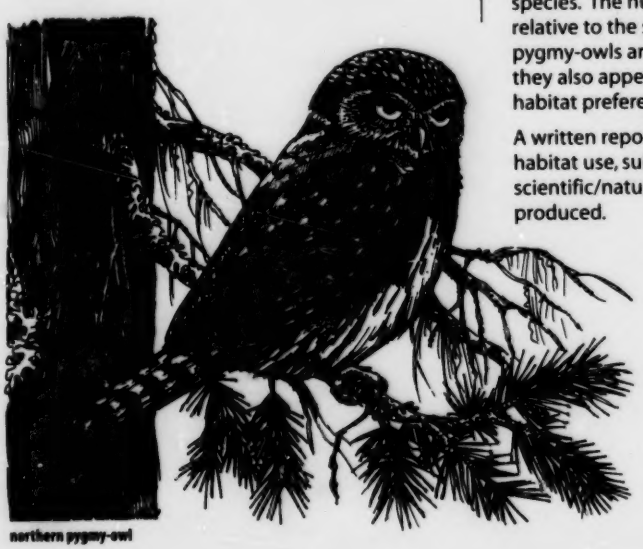
Results

This project was initiated at the end of the 2000-2001 fiscal year and surveys continued through to the end of April. Analyses have not been completed, however some preliminary results are available. Over 1500 call surveys for pygmy-owls have been conducted, over an area covering all accessible roads between Highway 1 and Highway 16, including national parks. In excess of 40 pygmy-owls have been found as of mid-April, as well as approximately 7 barred owls and individuals of several other owl species. The number of individuals found relative to the search effort suggests that pygmy-owls are not common in the region, and they also appear to have a relatively narrow habitat preference.

A written report documenting distribution and habitat use, suitable for submission to a scientific/natural history journal, will be produced.

Recommendations/Future Direction

Recommendations for future work include a detailed habitat analysis of areas in which pygmy-owls are located. This analysis may be integrated with forest management plans in the area.



northern pygmy-owl

COOPERATING AGENCIES

Alberta Conservation Association, Parks Canada, Sunpine Forest Products

For more information contact:

David Prescott *(see page 5).*

YEAR 2000 NATIONAL PEREGRINE FALCON CENSUS – ALBERTA

Project Supervisor: **Gordon Court**

REGION:
Provincial (conducted in Prairie, Bow, Parkland, Northern East Slopes, Northwest Boreal, Northeast Boreal)

TARGET SPECIES:
Peregrine Falcon (*Falco peregrinus anatum*)

WILDLIFE ACT CATEGORY:
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

purpose

To conduct a thorough inventory of the peregrine falcon population in order to estimate distribution, population size and productivity in Alberta.

Background

Prior to the 1970s, the peregrine falcon could be found nesting on the banks of every major river system in the province. However, worldwide usage of organochlorine pesticides such as DDT after World War II severely affected peregrine breeding success. In 1970, only one productive pair could be located in Alberta.

The Fish and Wildlife Division has been managing provincial populations of the *anatum* peregrine falcon for more than 25 years. The population in Alberta has grown from 1 to approximately 40 productive pairs over this period. Wildlife agencies in most other provinces have also been managing for the recovery of the *anatum* subspecies and the status of this animal has been evaluated by regular national inventories every five years. Peregrines in Canada were last surveyed in 1995, so a national census was planned for the summer of 2000.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) recently down-listed the *anatum* peregrine from Endangered to Threatened. With this ruling, the National Peregrine Falcon Recovery Team is now faced with the task of preparing a new recovery plan that will include delisting goals for the *anatum* subspecies. A prerequisite for this task is a thorough inventory of the peregrine population in Canada. Information obtained from the census will be provided to the Canadian Wildlife Service to update the status of *Falco peregrinus anatum* in Canada. The current level of pesticide contamination in Alberta peregrines will also be assessed.

Methods

Survey efforts in Alberta focused on historical nest sites and suitable habitat associated with historical locations. All major drainages containing historical peregrine falcon eyries and potential nest sites in Alberta were surveyed. Once pairs were identified, the technician attempted to do the following:

1. Ascertain banding status of adults;
2. Gain information on reproductive success and band young; and
3. Collect any addled peregrine eggs for pesticide residue analysis.

All data obtained were entered into the Biodiversity/Species Observation Database (BSOD).

Results

The 2000 survey located a total of 48 territorial sites. Twenty-three sites were located in southern Alberta and 25 sites were located in northern Alberta. No sites were occupied with single birds during the 2000-breeding season.

The total number of territorial locations recorded in Alberta during provincial surveys from 1970 to 2000, has increased from 3 to 48. In southern Alberta, the number of territorial locations has risen from 1 to 23. During both the 1975 and 1980 surveys, no territorial peregrine locations were found in southern Alberta. In northern Alberta, the number of territorial locations has risen from 2 in 1970 to 25 in 2000.

A total of 69 young were produced from a total of 39 breeding pairs. The southern Alberta population produced 54 young from a total of 20 breeding pairs and the northern Alberta population produced 15 young from a total of 19 breeding pairs. The number of young per breeding pair was 2.70 in southern Alberta and 0.79 in northern Alberta. Provincially there were 1.44 young/ territorial pair and 1.77 young/ breeding pair.

Recommendations/Future Direction

Monitoring of known nesting locations should continue, and any future survey efforts should focus on areas with a high probability of new nesting sites. In southern Alberta, all the known nesting locations are well documented and easily accessible. Ongoing spring surveys for presence/absence during the early breeding season and continued monitoring throughout the breeding season should continue. When possible, banding young and reading bands on adults should remain a high priority to further understand the population demographics of this recovering population.

Future annual surveys should remain focused on areas with high quality habitat, areas with active peregrine nesting sites nearby, and historical sites. The North Saskatchewan River, between Rocky Mountain House and Berrymore Ferry, and the Red Deer River, between the City of Red Deer and Morin, should be considered the highest priority areas for annual surveys. Both of these river sections can be surveyed effectively by jet boat.

The peregrine falcon has made a dramatic comeback to its natural environment in southern Alberta. The recovery, however, is not complete and ongoing management should continue with annual surveys, productivity monitoring and banding of young.

In northern Alberta, the feasibility of ongoing peregrine management is limited by accessibility issues and associated costs. However, many of the active peregrine sites in northern Alberta can be accessed easily by boat out of Fort Chipewyan. These sites could become a standardized block of nest sites to be monitored annually through a cooperative agreement with Parks Canada, Canadian Wildlife Service and Alberta Sustainable Resource Development staff. A dramatic shift in population size and productivity could be detected through a standard survey that is done annually without the associated costs of widespread monitoring in northern Alberta.

peregrine falcon

COOPERATING AGENCIES

Alberta Conservation Association, Canadian Wildlife Service, Parks Canada

For more information contact:

Gordon Court *(see page 5)* and see Species at Risk Report No. 2, Survey of the peregrine falcon (*Falco peregrinus anatum*) in Alberta.

PIPING PLOVER 2001 CENSUS PREPARATION

Project Supervisor: **David Prescott**

REGION:
Provincial (conducted in Parkland)

TARGET SPECIES:
Piping Plover (*Charadrius melodus*)

WILDLIFE ACT CATEGORY:
Endangered

PROVINCIAL GENERAL STATUS:
At Risk

COOPERATING AGENCIES

Canadian Wildlife Service, Alberta Conservation Association

For more information contact:

Dave Prescott *(see page 5).*

purpose To ensure that the 2001 International Piping Plover Census in Alberta is as comprehensive as possible and that it is well organized and ready to go by spring 2001.

Background

The piping plover is currently listed as either a threatened or endangered species throughout its range in North America, and is designated as *Endangered* under the *Wildlife Act*.

The piping plover breeds on sparsely vegetated beaches on larger alkaline lakes in the central and southern parts of the province. Over the past decade, approximately half of the provincial breeding population has been found on only nine lakes. Populations on a given lake are dynamic, changing annually with variation in water levels and the presence of suitable nesting substrates.

The fact that this species is concentrated on a few major lakes, coupled with declining populations elsewhere and potential threats to local populations, suggests that the Alberta population remains vulnerable to future declines. Continued monitoring of known breeding locations is needed to clarify population trends and potential factors limiting population size in the province.

Beginning in 1991, an international census for piping plovers has been conducted in Canada and the United States every five years. The next international census is slated for 2001, and in order to ensure that the Alberta portion will be as complete as possible, it is essential to identify new areas with potentially suitable habitat.

Methods

Field forms, maps, data sheets, protocol and past results were prepared for the 2001 international census. Workers were secured to conduct the inventory and assist in the compilation and prompt reporting of results, including both population and habitat comparisons to earlier assessments.

Results

Discussions have been held with area biologists and the Alberta Ad Hoc Piping Plover Team to identify new areas for possible inclusion in the census, and these areas will be checked by fixed-wing aircraft in April 2001. A list of remote lakes inspected, and recommendations for inclusion or non-inclusion in the 2001 census, will be prepared in a brief report.

A wage position was created in early December 2000 to assist with survey preparation. Compilation of data from the previous two surveys into a common database was initiated.

Information packages for all surveyors were assembled. These packages contained survey instructions, international and provincial data forms, survey buttons and maps. These packages will be distributed to surveyors in early April 2001.

Discussions were held with Saskatchewan and Manitoba co-ordinators, and with the Canadian Wildlife Service and US Fish and Wildlife Service co-ordinators to ensure that surveys are integrated.

Recommendations/Future Direction

This project will contribute to the successful and efficient completion of the 2001 International Piping Plover Census in Alberta. Some of the preparatory work will lead to the collection of data (during the census) that will be used for recovery planning and eventual habitat protection by the Alberta Piping Plover Recovery Team. These data are not required by the international census protocol, but we are using the opportunity to collect more specific information on habitat use and threats, which is necessary for management planning.

PIPING PLOVER MONITORING

Project Supervisor: **Gary Erickson, Richard Chabaylo**

REGION:
Prairie, Northeast Boreal

TARGET SPECIES:
Piping Plover (*Charadrius melodus*)

WILDLIFE ACT CATEGORY:
Endangered

PROVINCIAL GENERAL STATUS:
At Risk

purpose To update information on piping plovers in the Lethbridge Management Area (Prairie Region), and at Muriel Lake (Northeast Boreal Region).

Background

The piping plover is currently listed as either a threatened or endangered species throughout its range in North America, and is designated as *Endangered* under the *Wildlife Act*.

The piping plover breeds on sparsely vegetated beaches on larger alkaline lakes in the central and southern parts of the province. Over the past decade, approximately half of the provincial breeding population has been found on only nine lakes. Populations on a given lake are dynamic, changing annually with variation in water levels and the presence of suitable nesting substrates.

The fact that this species is concentrated on a few major lakes, coupled with declining populations elsewhere and potential threats to local populations, suggests that the Alberta population remains vulnerable to future declines. Continued monitoring of known breeding locations is needed to clarify population trends and potential factors limiting population size in the province.

The objectives of this study were to:

1. Survey all suitable habitat in the Lethbridge Management Area and at Muriel Lake to determine the number and location of nesting pairs; and
2. Re-survey these areas to estimate productivity by counting young, and to examine the factors involved in unsuccessful nests.

Methods

A ground search was conducted of known nesting areas and suitable water bodies in the Lethbridge Area (Prairie Region).

Potential piping plover nesting areas at Muriel Lake (Northeast Boreal Region) were searched by field crews on foot. Surveys were conducted during fair weather conditions.

Results

Prairie Region:

An area covering the east half of the St. Mary Reservoir dam to the south end of the reservoir was surveyed on May 31 and June 1, 2000. The reservoir was practically drained, and no piping plovers were found, despite nesting activity of other species in the area. Keho Lake was surveyed on June 5 and no piping plovers were observed, even at historical locations. Dramatic changes to the lake shoreline, due to water levels being kept artificially high, were observed.

Northeast Boreal Region:

Surveys for piping plovers were conducted on 3 occasions: May 29, June 23 and July 24. On May 29, two piping plovers were observed. These 2 birds were seen at different times, and quite possibly could have been the same individual. There was no apparent evidence of nesting. Other nesting shorebirds included several pairs of killdeers and American avocets.

On June 23, three piping plover pairs were found nesting. Several other species were also observed nesting and young were present in many of the nests.

Survey results from June 23rd at Muriel Lake

Species	Number	Breeding Status
piping plover	3 pairs	nesting; found one nest
killdeer	4 pairs	apparently nesting
American avocet	20 pairs	nesting; several nests with eggs/ new young
common tern	200-300 individuals	nesting; many nests with eggs
herring gull	1 pair	nesting; new hatchlings

Piping plovers were not observed during the July survey. However, observers recorded killdeer and American avocets with young, approximately 200 semi-palmated plovers and several hundred unidentified sandpipers (mostly the smaller "peeps"). The survey crew did not visit the island in the southwest corner of lake, where 3 pairs of piping plovers were observed June 23.

Recommendations/Future Direction

Prairie Region:

The lack of piping plovers at the Prairie sites could likely be attributed to human-induced

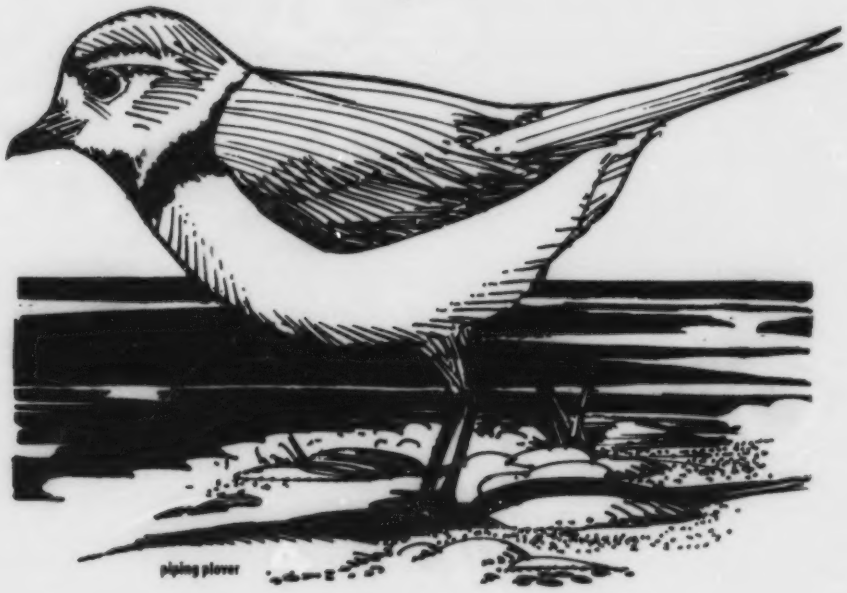
alteration of the shorelines, making them unsuitable for nesting. It is recommended that Fish and Wildlife Division personnel work with Irrigation (Alberta Environment) to try to manage water levels so that appropriate nesting habitat is maintained.

Northeast Boreal Region:
It is recommended that future census efforts at Muriel Lake, and other nearby water bodies, include a brief aerial reconnaissance to locate potential piping plover nesting areas prior to ground surveys. This approach would ensure that subsequent ground efforts include all suitable nesting habitats in the Muriel Lake area. It is also recommended that pair surveys are followed by nest searches, nest fate determination and brood counts to estimate survival and productivity.

Current knowledge indicates that Muriel Lake represents the northern limit of piping plover breeding distribution in Alberta. Colonization of Muriel Lake appears to be a recent phenomenon in response to receding water levels over several years. Should favourable habitat conditions persist, coupled with reproductive success, the local population of piping plovers may continue to increase at Muriel Lake. Long-term monitoring of reproductive effort and success is required to document local population trends, and to enable a better understanding of the role of Muriel Lake in the recruitment of piping plovers to the provincial population.

COOPERATING AGENCIES

None


piping plover

For more information contact:

Richard Quinlan or **Matt Besko**
(see page 5).

ALBERTA PIPING PLOVER PREDATOR EXCLOSURE PROJECT

Project Supervisor: **David Prescott, Isabelle Michaud (ACA)**

REGION:
Provincial (conducted in Bow, Parkland)

TARGET SPECIES:
Piping Plover (*Charadrius melodus*)

WILDLIFE ACT CATEGORY:
Endangered

PROVINCIAL GENERAL STATUS:
At Risk

purpose

To continue with the exclosure project as in previous years, on approximately 11 breeding lakes in Alberta.

Background

The piping plover is currently listed as either a threatened or endangered species throughout its range in North America, and is designated as *Endangered* under the *Wildlife Act*.

The piping plover breeds on sparsely vegetated beaches on larger alkaline lakes in the central and southern parts of the province. Over the past decade, approximately half of the provincial breeding population has been found on only nine lakes. Populations on a given lake are dynamic, changing annually with variation in water levels and the presence of suitable nesting substrates.

Nest predation has been identified as a significant limiting factor to piping plover reproductive success in the Canadian prairies. During 1995 to 1997, predator exclosures (cages that exclude predators from the nest but allow access by adult piping plovers) were tested and found to reduce nest predation. A province-wide program to install exclosures at all nest sites was initiated in 1998. This method has proven to be a relatively inexpensive and effective tool to aid the recovery of the endangered piping plover, and encourages partnerships between a variety of government and nongovernment organizations.

Methods

The following lakes were targeted for the exclosure project: the westernmost of the Reflex Lakes ("Reflex Lake"), Killarney Lake including the pond at the north end of the lake, Freshwater Lake, Cipher Lake, "Piper Lake", Metiskow Lake, Sunken Lake, Handhills Lake, Dowling Lake, "Chain Lake #4" and Birch Lake. Pair and brood surveys were carried out on these core breeding lakes.

Nests were monitored throughout the nesting period and the young were banded with aluminum and colour celluloid bands that identify them by year and lake of origin.

Data gathered during this project were entered into the Biodiversity/ Species Observation Database (BSOD).

Results

In total, 58 nests were found on 11 water bodies (see table). Overall hatching success (those nests hatching at least one egg) was 59% (34/58). Nests that were treated with large predator exclosures for either part or all of the incubation period had a 63% success rate (22 of 35 nests). Of these, the 23 nests treated with exclosures for the entire incubation period had 48% (11/23) hatching success, and the 12 nests where exclosures were applied and then removed during incubation had 92% (11/12) hatching success.

For nests where exclosures were not applied at all, 47% (9/19) were successful and the remainder were depredated. On Birch Lake, where small predator exclosures were applied throughout the incubation period, 75% (3/4) of the nests hatched.

Adult plovers were confirmed killed by predators at 6% (2/35) of large exclosures, one each on Reflex and Killarney lakes. Evidence of adult kills was found directly outside of the exclosures, and included several contour feathers on Killarney Lake and a partial carcass, including head and feathers, on Reflex Lake. No adult plovers were killed at the small exclosures on Birch Lake.

Nest summaries for study lakes

Lake Name	Province	No. of Nests	No. of Successful Nests	Hatching Success
Birch Lake	AB	4	3	0.75
Chain Lake #4	AB	2	1	0.50
Cipher Lake	AB	1	1	1.00
Dowling Lake	AB	5	1	0.20
Freshwater Lake	SK	7	4	0.57
Handhills Lake	AB	4	0	0.00
Killarney Lake	AB	5	3	0.60
Metiskow Lake	AB	1	1	1.00
Piper Lake	AB	3	0	0.00
Reflex Lake	AB/SK	23	18	0.78
Sunken Lake	AB	3	2	0.67
	Total:	**58**	**34**	**0.59**

The fates of the 35 nests originally treated with large predator exclosures is as follows:

- 11 nests hatched where the exclosures were left on until the end of incubation
- 1 nest was depredated inside of the exclosure
- 9 nests were abandoned for unknown reasons, possibly predation of adults
- 2 nests failed because adults were depredated
- 11 nests hatched after the exclosures had been removed
- 1 nest was depredated after the exclosure had been removed

Sixty-three chicks were banded in 2000. In addition to observations of newly banded chicks, 14 resightings of birds previously banded in either Alberta, Saskatchewan, or on the wintering grounds, were recorded.

Recommendations/Future Direction

Nest predation is still a limiting factor; therefore, research on this management technique must continue in order to maximize increases in productivity. Management issues that should be addressed include:

1) Other alternative exclosure designs should be studied to identify the potential for reduced cattle damage and depredation of adults. For instance, exclosures smaller than the present design, without tall rigid sides, may be less attractive to both raptors and cattle.
2) Efforts should continue to minimize damage to exclosures in areas where nesting beaches are accessed by livestock. It is likely that the size and mere presence of exclosures on beaches entices cattle to use the structures as "scratching posts." Restricting cattle from nesting areas during the nesting period (May to July) would eliminate this damage and reduce the degradation of soft nesting substrate by deep hoofprints.
3) Banding of chicks should continue, as recoveries and sightings of banded birds are important to increase the knowledge base for the species. The International Piping Plover Census, planned for the year 2001, will provide increased opportunity for observations of banded birds across the piping plover's winter and summer ranges.
4) A broad piping plover management strategy needs to be developed for Alberta. Combinations of limiting factors and management issues are often specific to individual nesting areas, making it difficult to apply a general management strategy to the entire piping plover population. For instance, any management strategy should include ways of addressing habitat protection, reduction of nest, chick and adult predation, control of vegetation encroachment, and mitigation of human disturbance factors.

Alberta Conservation Association, Alberta Sport, Recreation, Parks and Wildlife Foundation, Alberta North American Waterfowl Management Plan, Endangered Species Recovery Fund

For more information contact:

David Prescott *(see page 5)* and see Engley, L. and I. Michaud. 2000. Use of predator exclosures to protect piping plover nests in Alberta and Saskatchewan. (Report prepared for Alberta Conservation Association)

SAGE GROUSE MANAGEMENT AND RESEARCH PROGRAM

Project Supervisor: **Dale Eslinger**

REGION:
Provincial (conducted in Prairie)

TARGET SPECIES:
Sage Grouse (*Centrocercus urophasianus urophasianus*)

***WILDLIFE ACT* CATEGORY:**
Endangered

PROVINCIAL GENERAL STATUS:
At Risk

purpose

To support essential management and research required to ensure the recovery of sage grouse in the southeast corner of the province.

Background

The sage grouse is the largest of all North American grouse and depends on sagebrush for diet and protective cover. The loss of native sagebrush grasslands, has contributed to an estimated population decline of approximately 66-92% over the past 30 years. The number of known leks decreased from 21 in 1968 to 10 active leks in 2001.

Threats to sage grouse include disturbance at lek sites, overgrazing by cattle, oil and gas development, and road building. This species is found in a very restricted area of unique sagebrush-grassland habitat, and Alberta lies at the northern edge of its range.

The Alberta Endangered Species Conservation Committee has recommended that the following actions be pursued in the immediate future: management of leks and adjacent nesting areas on public land, negotiation of cooperative management strategies for lek sites and nesting areas on private land, extension of the sage grouse research program, and support for the current sage grouse planning effort.

Priority issues selected as focal areas for this project included:

- Lek management on grazing leases
- Landowner conservation agreements
- Extension of sage grouse research program
- Completion of inter-provincial Sage Grouse Recovery Strategy document

Methods

Lek Management
Accurately map all sage grouse leks and other key sites using a Geographic Information System (GIS). In co-operation with Public Lands, place protective notations (PNTs) on all active and inactive lek sites, and consultative notations (CNTs) on sage communities adjacent to leks.

Landowner Conservation Agreements
Establish landowner conservation agreements with all landowners who have an active lek on their property, using a variety of tools, including fencing and development of range management plans.

Sage Grouse Research Program
Monitor active and inactive leks in the spring using an established protocol, to determine population estimates. Track radio-collared female sage grouse to monitor survival, reproductive activities and habitat use.

Recovery Strategy
Complete the review process and finalize the Strategy.

Results

All active sage grouse leks have been mapped, by determining accurate Global Positioning System (GPS) locations and marking the perimeter of all active leks so that they could easily be imported into a GIS database (ArcView). Accurate hand-drawn maps of each lek site (active and inactive) have also been created, including a detailed description of the location and site. Other areas important to sage grouse have also been mapped and provided in a format for quick use in a GIS database (ArcView), including nesting locations, brood rearing locations and summer foraging sites. PNTs were placed on all active leks and some of the inactive sites.

Landowners with active lek sites on their property were visited; however, no conservation agreements were developed. These landowners were also invited to participate in the Sage Grouse Habitat/Protection Enhancement Committee, identified in the Recovery Strategy. Three meetings have been held and over half of the invited landowners have attended at least one meeting. The Alberta Fish and Game Association, Public Lands, Grasslands Naturalists and representatives from the oil and gas industry have also been involved. One of the key outcomes of this Committee was support for the restriction of sage grouse viewing and photography on leks, to minimize disturbance.

Lek surveys were conducted in the spring and research continued on nesting and brood rearing locations, summer foraging sites, reproductive effort, reproductive success and survival.

The Sage Grouse Recovery Strategy was completed, and it is now in a final edit phase.

Recommendations/Future Direction

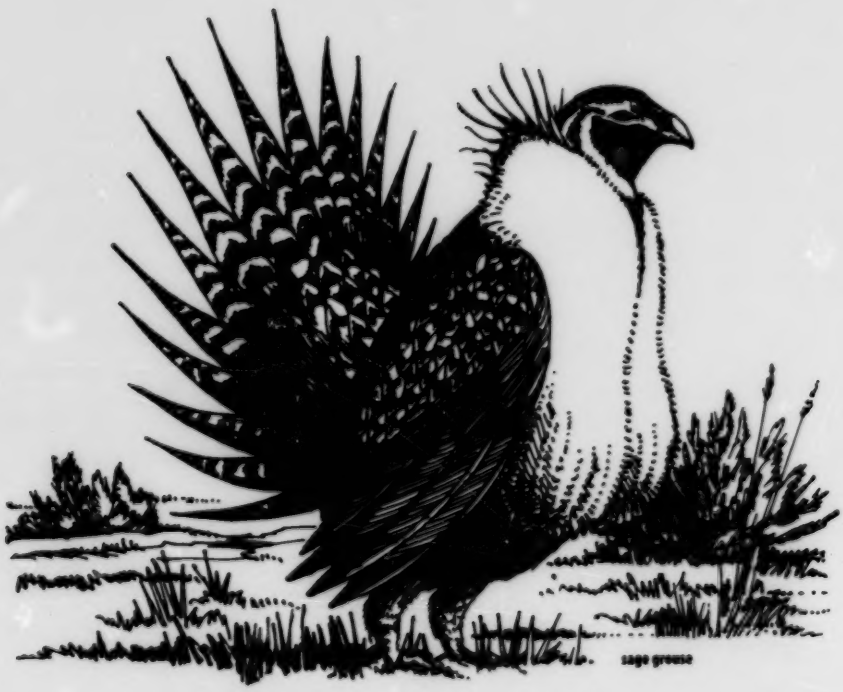
Stakeholder involvement remains paramount, and Fish and Wildlife Division (FWD) staff will continue to work with the Sage Grouse Habitat/Protection Enhancement Committee to promote management and conservation of sage grouse and associated habitats. Dependent on landowner co-operation, experimental grazing manipulations to decrease grazing intensity may be implemented.

A stewardship program will be developed to educate landowners on the use of sound grazing management practices to ensure that a healthy ecosystem exists for sage grouse and other prairie wildlife. Opportunities to work with industry to enhance habitat protection, particularly of lek sites, nesting and brood rearing areas, and to minimize disturbance to sage grouse, will also be explored.

Monitoring of leks during the spring, reproductive success, recruitment and chick survival will continue. Research efforts will focus on sage grouse habitat use in an attempt to understand reasons for the population decline. Mapping of important sagebrush landscapes has also been identified as a high priority in order to identify key areas for management.

The Sage Grouse Recovery Strategy will be forwarded to the Minister of Sustainable Resource Development for approval, and Recovery Action Plans will be developed.

University of Alberta, Alberta Conservation Association, Alberta Agriculture, Food and Rural Development – Public Lands Division



sage grouse

For more information contact:

Joel Nicholson *(see page 5)* and see Species at Risk Report No. 19, Assessing chick survival of sage grouse in Canada.

2000 TRUMPETER SWAN CENSUS

Project Supervisor: **Adam James**

REGION:
Provincial (conducted in Prairie, Northern East Slopes, Northwest Boreal, Northeast Boreal)

TARGET SPECIES:
Trumpeter Swan (*Cygnus buccinator*)

WILDLIFE ACT CATEGORY:
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

purpose

To determine the abundance and distribution of trumpeter swans as part of the five-year international census, and to update the Land Status Automated System (LSAS) and regional wildlife referral maps.

Background

Trumpeter swans once occurred over a broad area in North America, extending from Alaska to southern Quebec, and from Oregon to Mississippi. However, this species was nearly extirpated from Canada and the United States in the early 1900s, due to habitat destruction and overhunting. In the past 50 years, trumpeter swan populations have increased and are no longer considered to be at risk by the Committee on the Status of Endangered Wildlife in Canada. In Alberta, the trumpeter swan is currently listed as *Threatened* under the provincial *Wildlife Act*.

In Alberta, the primary breeding area for this species is near Grande Prairie; however, scattered flocks can be found throughout the province. These flocks occur in the Cardston-Pincher Creek area, Elk Island National Park, Edson-Whitecourt, St. Paul-Lac La Biche and Peace River areas.

Although differences in survey techniques make it difficult to establish trends in population, the general consensus is that trumpeter swan numbers are actually increasing. However, several limiting factors such as a shortage of winter habitat in the Tri-State area (Idaho, Montana, Wyoming), continuing human disturbance in breeding habitat, accidental hunting, and swan collisions with power lines still limit swan population growth.

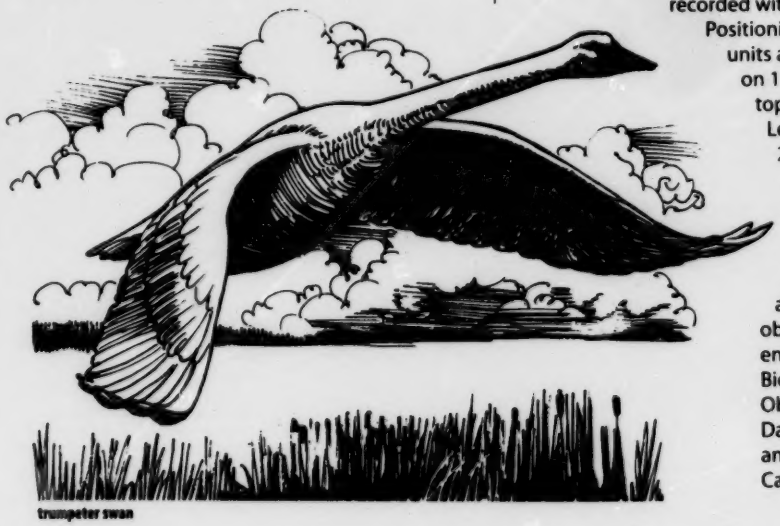
A complete census of trumpeter swans in Alberta will contribute to international population estimates and will allow protective measures to be applied to all breeding lakes.

Methods

Historical nesting lakes and some adjacent potential breeding habitat were surveyed. Areas further afield were also searched to locate pioneering swans that may be outside the historical nesting areas.

The surveys were conducted between 7 August and 14 September and included all water bodies that have been previously occupied by trumpeter swans, and some new water bodies that were suspected to contain swans. Most surveys were conducted by intensive searching from fixed-wing aircraft. However, surveys in the High Level area were conducted from helicopters, and surveys in Elk Island National Park were conducted by regular ground checks during the breeding season.

Trumpeter swan locations were recorded with Global Positioning System (GPS) units and/or marked on 1:250 000 topographic maps. Locations from the 2000 census were compared with previous locations and many new locations were added. All data obtained were entered into the Biodiversity/Species Observation Database (BSOD), and provided to the Canadian Wildlife



trumpeter swan

Service for inclusion in the national and international census data sets.

Results

A record number of 995 trumpeter swans was recorded in Alberta in 2000, including 668 adults and subadults (white swans), and 327 cygnets. Cygnets comprised 32.8% of all birds counted.

Counts of white swans and cygnets and swan locations from 7 August to 14 September 2000

Region	Total Swans	Total White Swans	White Swans Paired and/or with Cygnets	White Swans as Singles or Flocks	Cygnets	Locations Occupied
High Level	24	13	12	1	11	5
Peace River	200	141	120	21	59	65
High Prairie	72	37	22	15	35	16
Grande Prairie	608	404	222	182	204	134
Lac La Biche	9	9	4	5	0	5
Edson	32	29	22	7	3	15
Elk Island	13	8	8	0	5	4
Pincher Creek	37	27	14	13	10	11
TOTAL	**995**	**668**	**424**	**244**	**327**	**255**

New breeding lakes on public land were added to the trumpeter swan referral list, and provincial land use guidelines will be recommended for any activities proposed in these areas.

Recommendations/Future Direction

A critical shortage of winter habitat is widely considered to be the primary limiting factor for the Rocky Mountain population, which includes Alberta's trumpeter swans. As the Rocky Mountain population continues to grow, conditions in the wintering range will become even more crowded. To help reduce the dependence of Alberta's swans on the Tri-State wintering region, we should expand swan relocation projects, in an effort to establish breeding populations of swans that winter in new areas. Discussions should continue between the Fish and Wildlife Division and the Energy Utilities Board to help protect swans on water bodies adjacent to private land. Protection on public land should be expanded by updating protective notations (PNTs) to include new breeding lakes.

To effectively implement the first two recommendations, the Fish and Wildlife Division must have recent data on trumpeter swan distribution and abundance. Therefore, we recommend that local trumpeter swan surveys be continued at current levels until the next international census in 2005. As Alberta's trumpeter swan population continues to grow, educational brochures should be developed to encourage resource developers and private landowners to limit disturbance near swan habitat.

Canadian Wildlife Service, Alberta Conservation Association

For more information contact:

Adam James *(see page 5)* **and see Species at Risk Report No. 5, 2000 survey of the trumpeter swan (*Cygnus buccinator*) in Alberta.**

COLONIAL NESTING WATERBIRDS LAND USE INVENTORY

Project Supervisor: **Mark Heckbert**

REGION:
Northwest Boreal

TARGET SPECIES:
American White Pelican (*Pelecanus erythrorhynchos*), **Double-crested Cormorant** (*Phalacrocorax auritus*) and **Great Blue Heron** (*Ardea herodias*)

WILDLIFE ACT CATEGORY:
Non-game Animals

PROVINCIAL GENERAL STATUS:
Sensitive: American White Pelican and Great Blue Heron

Secure: Double-crested Cormorant

purpose

To enhance the existing knowledge of, and to protect colonial nesting waterbirds through population monitoring and land use management.

Background

The identification, management and monitoring of sensitive colonial nesters depend on the acquisition and analysis of reliable data on population size, distribution and trend. Access to current data is essential for the design, assessment and revision of conservation programs. Aerial and ground inventory programs will enable calculation of regional population size and trends and will complement similar existing provincial data. Additionally, collection of site-specific data will assist ongoing land use planning and management.

Methods

Data were compiled on known, possible and historical sites of these species through various sources. Aerial and ground surveys were conducted at these sites and key colonial nester maps were produced for Area Fish and Wildlife Division offices. Active sites were registered in Land Status Automated System (LSAS), the Biodiversity/Species Observation Database (BSOD), and as protected seasonal sanctuaries.

Results

Thirty-six water bodies were surveyed. A total of 62 colonies containing 12 different species were recorded on 18 water bodies. An additional 21 historical locations were found to be no longer active.

Recommendations/Future Direction

1) Future surveys should be started as early as the beginning of June. This timing will allow more water bodies to be surveyed and produce a more accurate record of colonies present. Surveying at this time would also allow American white pelican, double-crested cormorant, ring-billed gull and California gull colonies to be visited during the incubation period.
2) Additional time should be given to research a more extensive list of historical, known, and possible sites to survey. Communication between the public and the Alberta Conservation Association was minimal and more research on past studies could have been performed before fieldwork began.
3) All American white pelican colonies should have seasonal sanctuaries placed on them. There are few nesting sites within Alberta and a single colony represents a large portion of the breeding population. A seasonal sanctuary may help protect the colony from human disturbance.
4) All previously active colonies should be continually monitored in case of recolonization.
5) Another complete survey for colonial nesters should be completed in 2005.
6) Anecdotal information should also be investigated to confirm colony locations.
7) More time should be allotted for aerial surveys. A larger area can be covered in much less time than from the ground and time efficiency is essential given the short nesting period of colonial species. Twelve hours of rotary-winged surveying and twelve hours of fixed-wing surveying is recommended for future Northwest Boreal Region surveys.

Colony, nest, fledgling totals and breeding population estimate, Northwest Boreal Region, 2000

Species Name	Total Number of Colonies	Total Nest Count	Total Fledgling Count	Breeding Population Estimate
American White Pelican	3	60	1660	1780
Double-crested Cormorant	5	2637	-	5274
Great Blue Heron	7	83	-	166
Common Tern	4	375	18	762
Forster's Tern	4	63	-	126
Black Tern	4	108	-	216
Ring-billed Gull	6	324	193	714
California Gull	5	848	408	1832
Franklin's Gull	5	5433	-	10 866
Eared Grebe	11	1693	-	3386
Western Grebe	6	1216	-	2432
Red-necked Grebe	2	2	-	4

*One unknown, white-headed gull colony (15 nests) on Orloff Lake and one unknown grebe colony (6 nests) on Winagami Lake are not included.

Alberta Conservation Association, Ducks Unlimited, Alberta Agriculture, Food and Rural Development - Public Lands Division, Alberta Environment-Land & Forest Service

For more information contact:

Adam James *(see page 5)* and see Species at Risk Report No. 7, Colonial nesting waterbird survey in the Northwest Boreal Region - 2000.

INVENTORY OF COLONIAL NESTING WATERBIRDS

Project Supervisor: **Richard Chabaylo, Matt Besko**

REGION:
Northeast Boreal

TARGET SPECIES:
American White Pelican (*Pelecanus erythrorhynchos*), **Black-crowned Night-Heron** (*Nycticorax nycticorax*), **Black Tern** (*Chlidonias niger*), **Caspian Tern** (*Sterna caspia*), **Forster's Tern** (*Sterna forsteri*), **Great Blue Heron** (*Ardea herodias*), **Western Grebe** (*Aechmophorus occidentalis*), **and Double-crested Cormorant** (*Phalacrocorax auritus*)

WILDLIFE ACT CATEGORY:
Non-game Animals

PROVINCIAL GENERAL STATUS:
Sensitive: American White Pelican, Black-crowned Night-Heron, Black Tern, Caspian Tern, Forster's Tern, Great Blue Heron, Western Grebe

Secure: Double-crested Cormorant

Alberta Conservation Association

For more information contact:

Matt Besko *(see page 5)*.

purpose

To monitor population trends of sensitive colonial nesting waterbird species in the Northeast Boreal Region.

Background

The Northeast Boreal Region has a high abundance of lakes and consequently the highest proportion of colonial nesting waterbird locations in the province. The identification, management and monitoring of sensitive colonial nesters depend on the acquisition and analysis of reliable data on population size and distribution. Establishing population trends may help identify environmental problems (e.g., deposition of acidifying emissions in the Fort McMurray region) before they become serious threats.

Methods

Aerial surveys were conducted using fixed-wing aircraft in June and July. Departure points included Lac La Biche, Fort McMurray and Fort Chipewyan. Colony size was estimated (# of nests), and location was marked with GPS co-ordinates and recorded on a 1:50 000 base map. Ground or boat surveys were used if an accurate size estimate was not obtainable through aerial surveys. Archival records (St. Paul Fish and Wildlife Division), the Biodiversity/ Species Observation Database (BSOD) and other potential data sources were reviewed for locations, dates and population trends. All data will be loaded into BSOD.

Results

Colonial nesting species were located through surveys of 50 lakes in late June 2000, and inspections of 25 lakes for double-crested cormorant and great blue heron were conducted in June and July 2000. Of the target species, American white pelican, black tern and great blue heron were observed on 35 of the 50 lakes in the surveys. Other species observed included gulls (unidentified and California), cormorants, bald eagle (and a possible golden eagle), trumpeter swan, white-winged scoter, terns (unidentified and common), Canada goose, osprey and grebes (unidentified and red-necked). The presence of great blue heron was confirmed on all of the 12 lakes checked for this species in the inspections, and double-crested cormorants were observed on all but 1 of the 13 lakes checked for this species.

Recommendations/Future Direction

Given the possible decline in the number and size of great blue heron colonies in Alberta, it is recommended that a provincial great blue heron survey be conducted to determine current breeding population size and trend. This information could be used for the development and delivery of management and conservation programs for this species and its habitat. Depending on the outcome of the project, it could also lead to the initiation of a detailed status report on great blue heron. Colonial nesting bird inventory data analyses and a survey protocol pilot are also planned, to enhance management efforts for these species.

fish

BRASSY MINNOW INVENTORY

Project Supervisor: **Travis Ripley**

REGION:
Northwest Boreal

TARGET SPECIES:
Brassy Minnow (*Hybognathus hankinsoni*)

WILDLIFE ACT CATEGORY:
None

PROVINCIAL GENERAL STATUS:
Undetermined

purpose To ensure that the fishery development strategy for Musreau Lake is compatible with sustainability of the brassy minnow.

Background

The brassy minnow occurs in the Milk River and its tributaries. There are also records of brassy minnows from Musreau Lake, a Pleistocene refuge in the Smoky River drainage (a tributary of the Peace River), and from the Athabasca and House rivers near Fort McMurray. This species does not appear to be abundant anywhere in Alberta. It occurs primarily in running water, but nothing is known about its habitat requirements.

The Fish and Wildlife Division is evaluating the stocking of alternate species in Musreau Lake to provide a fishery for the city of Grande Prairie. A Musreau Lake management plan will be produced, including baseline information on brassy minnow status at this location and assessments of risk to the population under proposed management.

Summary of species captured at Musreau Lake 2000

Species	Number captured	Mean fork length (mm)
Brassy minnow	1	79.0
Lake chub	37	74.3
Burbot	3	89.7

Methods

Inventories were conducted to determine life stage abundance and habitat use. Critical habitats were determined based on life stage. The spawning period was determined, as were potential predators of this species.

A literature review was conducted to evaluate the impact or risks associated with future stocking options. Age, growth, and catch per unit effort data were entered into the Fisheries Management Information System (FMIS) database.

Results

In total, only 3 species of fish were captured (young-of-the-year burbot, lake chub and brassy minnow). Of all these captures, only 1 brassy minnow was caught, which was 79 mm in length. The population of brassy minnow in Musreau Lake appears to be very small.

Habitat in the vicinity of the brassy minnow capture site consisted of silt substrate with a large amount of submerged grass. This habitat type is uniform throughout the outlet stream (Musreau Creek) for approximately 900 m downstream from the lake, and is consistent with habitat descriptions from the literature and previous collections.

Recommendations/Future Direction

To determine population viability, it is imperative to collect information on specific vital rates (growth rate, survival rate and fecundity) and to monitor population size through time. Other factors, including density dependent mortality and survival with predators, must also be determined. With the very low number of minnows captured during this assessment, further study is required to gain a better understanding of brassy minnow population parameters. It is recommended that a follow-up survey be conducted to expand the habitat inventory and determine brassy minnow abundance.

Sampling in June may permit the capture of more minnows and provide a more accurate assessment of population size. In addition, baiting minnow traps with various baits and expansion of sampling locations in the inlet and outlet areas of Musreau Lake may improve capture success. Increased sampling of Musreau Creek is also required to determine the extent of downstream

movement of brassy minnow and whether this species has migrated into the Kakwa River. This information will be required to outline the brassy minnow management plan for Musreau Lake.

Musreau Lake has been suggested as a potential location to develop a robust recreational fishery for an alternate species, such as walleye. However, based on this assessment, further research will be required to predict the response to the introduction of another top predator into the lake.

Bull trout have been found in Musreau Lake, and the ramifications of the presence of this species are as yet unknown. However, it is reasonable to suggest that brassy minnow will continue to survive, considering that it has coexisted with other indigenous predators over time. Further research will also be necessary to determine the distribution and status of brassy minnow within the province.

Provincial Museum of Alberta, University of Alberta

For more information contact:

Adam James *(see page 5)* and see Species at Risk Report No. 6, 2000/2001 brassy minnow (*Hybognathus hankinsoni*) inventory at Musreau Lake and outlet.

brassy minnow

BULL TROUT HABITAT FRAGMENTATION

Project Supervisor: **Travis Ripley, Dave Walty**

REGION: .
Northwest Boreal

TARGET SPECIES:
Bull Trout (*Salvelinus confluentus*)

WILDLIFE ACT CATEGORY:
None

PROVINCIAL GENERAL STATUS:
Sensitive

purpose | To conduct an inventory of stream crossings in the Simonette drainage to identify all culverts blocking fish migration.

Background

Bull trout were once common in all of the major river systems flowing from the eastern slopes of the Rocky Mountains. When numbers were at their highest, the species' range extended down the waterways and out into Alberta's prairie and parkland.

Fragmentation is the most significant habitat issue affecting bull trout sustainability. Habitats available for bull trout are at risk from fragmentation due to barriers resulting from poorly designed culverts and, more often, old culverts that fail due to degradation. The Simonette drainage is a high quality bull trout stream that has experienced heavy impact from road networks. This project will quantify the number of barrier stream crossings in one drainage (represents one bull trout population) so that the significance of the problem can be relayed to industry and land managers. Additional work will be conducted to evaluate the availability of bull trout habitat currently not occupied and to monitor these areas once the blockage to fish migration is repaired.

In Alberta, this species is not in immediate danger of extirpation but could easily disappear from some of our lakes and streams. Many populations are unable to maintain their current numbers and will continue to diminish unless managed wisely. Fish inventories completed as part of this program will also provide valuable information on the distribution and abundance of all fish species within the study drainage.

Methods

Phase 1, conducted in 2000-2001, focused on expanding the inventory work to develop a data set to use with the crossing data, once it becomes available.

Fish and stream habitat variables were sampled in the Kakwa and Simonette watersheds during the 2000-2001 field season in order to expand the database of fish community structure, stream habitat and watershed attributes. An emphasis was placed on increasing the representation of 1st to 6th order stream sites. Electrofishing upstream and downstream of crossings was conducted on a subset of crossings.

Results

Sampling of fish species, number and length, as well as 16 habitat attribute variables, was completed at 140 sites (62 sites in the Kakwa and 78 sites in the Simonette watersheds). There were 10 fish species found in the Kakwa and 21 fish species found in the Simonette watersheds. Fish community and in-stream habitat variables have been uploaded into the provincial government's Fisheries Management Information System (FMIS), and when combined with other data sources comprise a moderately large dataset (268 sites in the Kakwa and 444 in the Simonette) to evaluate linkages between fish communities and watershed attributes.

Recommendations/Future Direction

The crossing inventory is underway and will be completed in the 2001-2002 fiscal year. A final report will be provided for the project in winter of that year.

COOPERATING AGENCIES

Alberta Conservation Association, Alberta Research Council, Department of Fisheries and Oceans Canada, Diashowa-Marubeni International, Manning Diversified Forest Products

For more information contact:

Adam James *(see page 5)* and see Species at Risk Report No. 14, Cumulative effects of watershed disturbances on fish communities in the Kakwa and Simonette watersheds. The Northern Watershed Project. Study 3 Progress report.

BULL TROUT INVENTORY AND STATUS

Project Supervisor: **David Christiansen**

REGION:
Parkland

TARGET SPECIES:
Bull Trout (*Salvelinus confluentus*)

WILDLIFE ACT CATEGORY:
None

PROVINCIAL GENERAL STATUS:
Sensitive

purpose

To continue an inventory and documentation of current bull trout distribution and status within priority drainages in the Parkland Region where little or no previous fisheries inventory work has been done.

Background

Bull trout were once common in all of the major river systems flowing from the eastern slopes of the Rocky Mountains. In the early 1900s, the range of bull trout extended from the headwaters of most river systems out into Alberta's prairie and parkland.

During the last 50 to 70 years, there has been a significant decline in both the abundance and distribution of this species. This is primarily as a result of overfishing; however, changes in habitat have also contributed to the decline. It is also suspected that the decline of bull trout populations has occurred in part as a result of competition from introduced brook, rainbow and brown trout. In addition, there is concern that the genetic integrity of certain populations may be threatened by the potential for hybridization with brook trout.

In Alberta, bull trout are not in immediate danger of extirpation; however, there is strong concern that certain populations, still surviving in a depleted state, could easily be lost from some of our lakes and streams if not managed carefully.

In 1995, due to the depleted status of the species, a complete ban on sport fishing of bull trout was implemented in Alberta. The development of a more detailed knowledge base and understanding of current bull trout status and distribution is critical to the management of the species. This information will also assist with the evaluation of proposals for the restoration of any harvest of this species. Inventory information will be used in dealing with various land use issues that can have an impact on habitat and populations. Habitat conditions, potential spawning and rearing areas, and potential habitat limitations in these drainages will also be identified. Information on other fish species (such as spoonhead sculpin and lake trout) captured during bull trout inventory work will also be recorded.

Methods

An inventory was conducted on selected streams using standardized Cooperative Fisheries Inventory Program survey techniques to determine the presence and status of bull trout populations and other fish species, habitat conditions and key habitat areas.

Inventory priorities included the upper North Saskatchewan River and tributaries, upper Blackstone River and tributaries, and upper Brazeau River and tributaries. Due to resource limitations and water conditions, inventory focused mainly on the North Saskatchewan River and its tributaries above the Abraham Reservoir. The main stem from the Banff Park boundary to the Abraham Reservoir was surveyed in the spring of 2000, and 65 survey sites along the tributaries of the river were completed during the summer. Two tributaries below the Abraham Reservoir were surveyed to verify reports of bull trout spawning in the fall. In addition, 10 survey sites were completed in the late fall on the upper Brazeau River in the vicinity of the confluence with the Cardinal River.

Basic fish measurements, species composition, relative abundance, life stage occurrence and site habitat information were recorded, and a photographic record of habitat sites was created. All inventory data were loaded into the Fisheries Management Information System (FMIS).

Results

A number of tributary streams (e.g., Loudon Creek) were found to contain large numbers of young-of-the-year bull trout in their lower reaches, suggesting that these are likely key spawning streams. Information on other native fish species (most notably spoonhead sculpin and lake trout) was also collected during the inventory program. The inventory program also identified a number of potential migration barriers, in the form of culverts.

Recommendations/Future Direction

The overall low numbers of bull trout captured during this inventory confirm the need to maintain the zero harvest regulation on this species in these waters Special protection is required for those tributary streams that show evidence of supporting bull trout spawning and rearing. In addition, culverts that were identified as migration barriers to bull trout must be corrected.

Additional fish collections and tissue collection for DNA analysis should be undertaken on streams within the study area to assess the extent to which hybridization between brook trout and bull trout may have occurred. Bull trout inventory on all remaining tributaries of the North Saskatchewan River above the Bighorn Dam and on the Bighorn Reservoir itself should be completed in the near future. A bull trout population monitoring section should be established on the main stem of the upper North Saskatchewan River.

COOPERATIVE EFFORTS

Alberta Conservation Association, Cooperative Fisheries Inventory Program

For more information contact:

David Prescott *(see page 5)* and see Species at Risk Report (in prep.), Rocky-Nordegg bull trout inventory and status project 2000.

BULL TROUT RECOVERY EVALUATION

Project Supervisor: **Richard Quinlan**

REGION:
Prairie

TARGET SPECIES:
Bull Trout (*Salvelinus confluentus*)

***WILDLIFE ACT* CATEGORY:**
None

PROVINCIAL GENERAL STATUS:
Sensitive

purpose To assess the status of bull trout populations, focused on the population occurring in the Oldman River basin.

Background

Bull trout were once common in all of the major river systems flowing from the eastern slopes of the Rocky Mountains. When numbers were at their highest, the species' range extended down the waterways and out into Alberta's prairie and parkland.

During the last 25 years, there has been a significant decline in both the abundance and distribution of this species. This is primarily as a result of over-fishing; however, changes in habitat also contributed to the decline of this species.

This species has also declined as a result of competition from introduced brown, rainbow and brook trout. The genetic integrity of native bull trout is threatened by interbreeding with brook trout.

In Alberta, this species is not in immediate danger of extirpation but could easily disappear from some of our lakes and streams. Many populations are unable to maintain their current numbers and will continue to diminish unless managed wisely. A number of projects focusing on this species have been initiated in the province, and if synthesized, could prove extremely beneficial in determining the status of this species in the Oldman River basin and elsewhere.

Methods

All available electronic files and hard copy printouts were reviewed in order to compile a fish data file in a format suitable for loading into the Fisheries Management Information System (FMIS). Waterton Lakes National Park was contacted to obtain additional data that may be stored there. A literature review was conducted on bull trout distribution and population numbers in the Oldman River basin, while assessing information gathered from previous projects. These projects include the Belly River bull trout project, Oldman basin redd counts, proposed Chain Lakes Reservoir-Willow Creek stocking, and the Dutch Creek population assessment.

Results

Work was conducted over a period of about two weeks over the winter. It involved collating all of the available data on bull trout from the Waterton drainage, plus data on other species from both the Waterton and Belly drainages. A review of the data collected revealed that there were some collections of bull trout for which the collection site was uncertain, or could not be determined from the electronic files available. Clarification of the capture locations is still in progress.

Recommendations/Future Direction

Entry of these data into FMIS remains on hold until we can obtain the capture locations. The project remains in progress. The intention is to use the collated data to identify areas where further inventory work is required, for instance in areas where habitat appears suitable but no bull trout have been found.

Waterton Lakes National Park (Parks Canada)

For more information contact:

Richard Quinlan *(see page 5).*

ELECTRO-FISHING, GILL NETTING AND GENETIC SAMPLING OF CUTTHROAT TROUT

Project Supervisor: **Gordon Court, Brian Lajeunesse**

REGION:
Provincial (conducted in Prairie, Bow, Parkland)

TARGET SPECIES:
Cutthroat Trout (*Oncorhynchus clarki*)

WILDLIFE ACT CATEGORY:
None

PROVINCIAL GENERAL STATUS:
Secure

purpose

To assess the status of pure native westslope cutthroat trout populations, and assess the genetic variation and the extent of hybridization between cutthroat trout and rainbow trout.

Background

Westslope cutthroat trout once occupied the main stems of the Bow and Oldman rivers and their major tributaries. Except in the upper Oldman and Castle River basins, native stocks are now rare in Alberta, existing only in short reaches of a few isolated headwaters.

Cutthroat trout live in headwater streams and are vulnerable to extreme flood events and other natural disasters. Perhaps the most significant habitat threat to cutthroat trout is habitat damage resulting from cattle grazing in the foothills of the eastern slopes.

The integrity of native cutthroat trout populations is also threatened by hybridization with introduced rainbow trout. In fact, introduced cutthroat trout stock and hybridized populations are presently more common than pure native populations. This study will represent an original contribution to the existing knowledge in the field of fish biology and molecular genetics, and at the same time will provide necessary biological information for the management of westslope cutthroat trout.

Methods

Seventy-two sites in Alberta were sampled in an attempt to cover the whole range of the known or suspected present distribution of indigenous, introduced and hybridized cutthroat trout populations. DNA was extracted from adipose fins, which were clipped from individual fish.

Results

During the first field season, 72 creeks across Alberta were sampled, from Waterton Lakes to Banff National Park. Of the 72 creeks sampled, 53 contained cutthroat trout.

Eight hundred and six samples of adipose fins were collected, and fish were also examined for their morphological characteristics. It appears that most of the populations are hybridized with rainbow trout; however, the final conclusion will be given after the genetic analysis is complete.

Only a few sampled creeks are very productive and support meta-populations of cutthroat trout (e.g., Daisy Creek, Camp Creek, Unnamed/ Livingstone River); others support only small populations.

Recommendations/Future Direction

During 2001-2002, additional sampling will be conducted in the Kananaskis drainage, in areas where pure westslope cutthroat trout are suspected to occur. Genomic DNA will then be isolated from all adipose fin samples collected. The isolated material will be amplified and microsatellite analyses will be conducted to determine the genetic variability and level of hybridization of cutthroat trout in Alberta. A final report on the research will be completed by March 2002.

Concordia University College of Alberta, University of Szczecin, Poland, University of Calgary

For more information contact:

Sue Cotterill *(see page 5)*.

LAKE STURGEON ANGLER SURVEY AND VALIDATION STUDY

Project Supervisor: **Cam Wallman**

REGION:
Bow

TARGET SPECIES:
Lake Sturgeon (*Acipenser fulvescens*)

***WILDLIFE ACT* CATEGORY:**
None

PROVINCIAL GENERAL STATUS:
Undetermined

purpose To continue the angler survey for the year 1999-2000 and to conduct directed monitoring contacts with anglers during the summer of 2000.

Background

Alberta represents the westernmost portion of the lake sturgeon's range. This species is found in the lower reaches of the Oldman, Bow and Red Deer rivers, the South Saskatchewan River to the Saskatchewan border, and in the North Saskatchewan River to the Brazeau and lower Clearwater rivers.

The numbers of sturgeon are undoubtedly lower now than when they were first described by European settlers in the early 1800s. Recently obtained data may indicate an increase in abundance over the last 30 years. However, present distribution has likely been reduced from the historical distribution due to overfishing and habitat degradation. Direct contact with anglers is necessary to confirm and validate survey results. No validation has been conducted in the past decade and it is vital in order to ensure that the survey results document the actual recreational use of sturgeon.

Methods

In order to track the recreational fishing of sturgeon, a special licence is required. With this licence, individual anglers are surveyed and harvest data, including abundance and distribution information, are obtained. This method has been providing data on sturgeon harvest for 30 years.

Harvest data on lake sturgeon taken by anglers in the summer of 2000, including weight and length measurements, were collected through directed monitoring contacts (creel survey) and were compared with information from previous angler surveys.

Results

1. **Angler Information**
   Out of the 79 parties who indicated that they fished for sturgeon, only 38 had at least 1 member who possessed a current sturgeon licence. It is suspected, therefore, that as much as 50% of sturgeon angling is conducted without a licence. This figure may be even higher due to the fact that data were collected as a summary by angler party instead of on an individual basis.
2. **Sturgeon Data**
   The number of sturgeon caught this year was apparently low in comparison with other years, according to angler interviews. This can be attributed to two factors. The first is that the majority of angling apparently occurred later in the year. Additionally, extremely low water levels this year may also have contributed to the low catch. Flow rates for the South Saskatchewan River never approached average or even minimum flow rates during the course of the summer, and did not display the peak usually seen in June.

   Of the 55 sturgeon captured during the course of this survey, 28 (50.9%) were taken by unlicensed anglers. As a result, it can be concluded that the actual number of sturgeon caught annually is significantly higher than reported.

Recommendations/Future Direction

In addition to collecting sturgeon data, the 2000 creel survey was intended to assess future harvest study designs. Some suggested improvements to increase the amount and quality of data collected in future surveys include the following:

1. Increase the time span for data collection.
2. Increase the number of angler staff during the first weekend following the opening of the sturgeon season.
3. Collect licence data on an individual basis instead of summarizing by group.
4. The next step in the verification of the data from the annual sturgeon fishing questionnaire entails the collection of creel survey data for successive years. Comparison of survey data to the data returned from the questionnaire on an annual basis would give an indication of the accuracy of the latter.
5. Information obtained during the summer 2000 creel survey, anecdotal observations by anglers, and comments from conservation officers indicate that there is a need to verify harvest figures. Any future study should incorporate this into the design.

CONFLICTING AGENCIES
None

For more information contact:

Arlen Todd *(see page 5)* and see Species at Risk Report No. 9, Survey of the lake sturgeon (*Acipenser fulvescens*) fishery on the South Saskatchewan River, Alberta (June-September, 2000).

ABUNDANCE, DISTRIBUTION AND STATUS OF PYGMY WHITEFISH IN THE ATHABASCA RIVER

Project Supervisor: **George L. Sterling**

REGION:
Northern East Slopes

TARGET SPECIES:
Pygmy Whitefish (*Prosopium coulteri*)

***WILDLIFE ACT* CATEGORY:**
None

(ESCC Recommendation: Data Deficient)

PROVINCIAL GENERAL STATUS:
May Be At Risk

None

purpose

To verify the status of pygmy whitefish in the Athabasca River main stem.

Background

Pygmy whitefish have been found in Alberta only in the upper Athabasca River system from Jasper National Park to Whitecourt (in Solomon Creek and Snake Indian River), and in upper Waterton Lake. The species has been reported from the eastern (Saskatchewan) end of Lake Athabasca, and has not been found in Cold Lake in spite of extensive searching efforts in the area.

Pygmy whitefish are a glacial relict species and require cold water. They prefer the deep areas in large, cold lakes as well as cold streams. Their habitat in the upper Athabasca River, both inside and outside of Jasper National Park, could be deteriorating due to human activities.

Updated status information could be incorporated into watershed management planning to ensure habitat protection and the long-term viability of this rare species.

Methods

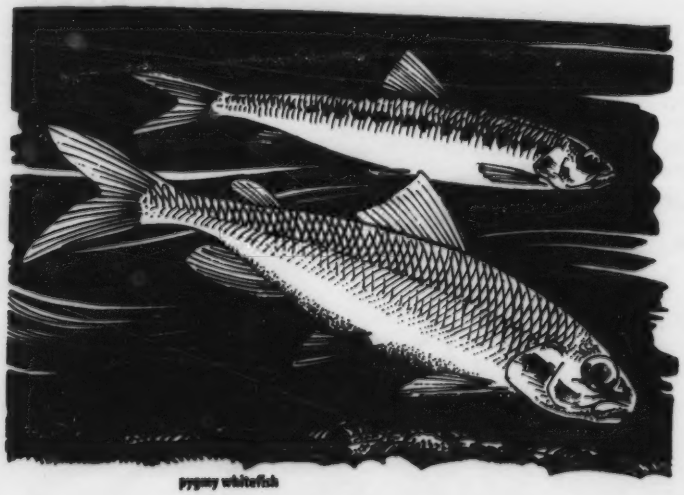
A historical data review was conducted, with the results entered into the Fisheries Management Information System (FMIS).

Results

The results of this work clearly demonstrated a low occurrence of records of pygmy whitefish. However, observation of low population numbers may reflect a misidentification of pygmy whitefish as juveniles of the much more abundant mountain whitefish, leading to incorrect records of the species (Mackay 2000). Additionally, Alberta represents the eastern periphery of this species' range in western North America, and as a result, it may occur naturally at low levels in the province. Further study, focused specifically on the identification of pygmy whitefish, will be required to determine the exact causes of rarity.

Recommendations/Future Direction

Identification of water body locations and associated identification numbers, conversion and verification of positions from historical files, and the creation of distribution maps and working maps is recommended using spatial data and a Geographic Information System (GIS). Future work should be conducted on a province-wide basis instead of in a single region, to give a more accurate reflection of the status of pygmy whitefish in Alberta. It is also recommended that data input continue for those watersheds in the Northern East Slopes that were either missed or not entered due to time constraints.



pygmy whitefish

For more information contact:
Lisa Wilkinson *(see page 5)*.

INTROGRESSION AND STATUS OF INDIGENOUS RAINBOW TROUT STOCKS IN ALBERTA

Project Supervisor: **George L. Sterling**

REGION:
Northern East Slopes

TARGET SPECIES:
Rainbow Trout (*Oncorhynchus mykiss*)

WILDLIFE ACT CATEGORY:
None

PROVINCIAL GENERAL STATUS:
Secure

purpose

To preserve the genetic integrity of the "Athabascan" strain rainbow trout.

Background

Since the late 1920s, non-native rainbow trout have been introduced to significant portions of the upper Athabasca River watershed, which is the only region of Alberta supporting indigenous populations of rainbow trout. In fact, indigenous rainbow trout are found east of the Rocky Mountains in only two watersheds: the Athabasca in Alberta and the Peace in British Columbia.

Naturalized populations of rainbow trout are now widespread in some watersheds in Alberta because of extensive stocking programs, and have affected native trout stocks in drainages in the southern portion of the province, particularly westslope cutthroat trout. In the last decade, substantial declines in the abundance of indigenous rainbow trout have been observed in drainages within the natural distribution of the rainbow trout strain.

Habitat degradation from extensive land use activities and overharvest by sport fishers may be contributing to this decline. More stringent habitat protection and harvest regulation strategies have failed to protect populations from further decline. Although current stocking programs within the indigenous range have been carefully managed to keep introduced trout isolated, past stocking programs may have resulted in significant genetic introgression within the indigenous strain, and may also be a factor in stock decline.

Methods

Rainbow trout tissue (adipose fin clip) samples (10 per site) were collected from each historical stream stocking site (approximately 15), and from 15 sites with no stocking history. DNA analysis will be conducted on the tissue samples.

Results

The tissue samples have been collected and DNA analysis has been initiated.

In total, 30 sites were visited and 306 samples were collected: 155 samples from 14 unstocked sites and 151 samples from 16 stocked sites. The results of the DNA analysis should be available within a year.

Recommendations/Future Direction

The results of the DNA analysis will be used to distinguish between, and evaluate the relative abundance of, indigenous versus introduced rainbow trout. Management actions will be developed for those areas where the introduced strain is believed to be threatening the genetic integrity of the indigenous strain.

Foothills Model Forest, Alberta Conservation Association

For more information contact:

Lisa Wilkinson *(see page 5)*.

SHORTJAW CISCO INVENTORY AND STATUS IN ALBERTA

Project Supervisor: **Mark Steinhilber** (Provincial Museum of Alberta), **Larry Rhude**

REGION:
Provincial (conducted in Northeast Boreal)

TARGET SPECIES:
Shortjaw Cisco (*Coregonus zenithicus*)

WILDLIFE ACT CATEGORY:
None

PROVINCIAL GENERAL STATUS:
May Be At Risk

purpose

To determine the distribution, relative abundance and status of shortjaw cisco in Alberta.

Background

Provincially, the shortjaw cisco is only known to occur in Barrow Lake, in northeastern Alberta. It has been reported from Gregoire Lake, Lake Athabasca and possibly Cold Lake, but is not confirmed at any of these latter sites.

Previous research indicates that the shortjaw cisco is relatively rare in Barrow Lake; however, additional sampling is necessary to determine population trends. More extensive sampling is needed in potentially suitable Shield lakes to determine the extent of occurrence and distribution of shortjaw cisco in Alberta.

The shortjaw cisco is not well known anywhere in its range, and its status in Alberta should be thoroughly reviewed.

Methods

Eight lakes, including Barrow Lake, were sampled in three 10-day expeditions. Sites were accessed by floatplane.

Gill nets were used to capture samples over a three-day period at each site. Sampling protocols for Barrow Lake were developed in consultation with staff from Fish and Wildlife Division. Data obtained were entered into the Fisheries Management Information System (FMIS).

Results

Six hundred and sixteen cisco were captured at 7 lakes in the Canadian Shield region of Alberta. The lakes sampled were Barrow Lake (cisco n= 199), Fletcher Lake (n= 204), Wylie Lake (n= 10), Winnifred Lake (n= 146), Burstall Lake (n= 0), Dawson Lake (n= 7), Bayonet Lake (n= 38), and an Unnamed Lake (n= 13). Burstall Lake did not yield any cisco, but a single round whitefish (*Prosopium cylindraceum*) specimen was acquired here. No new populations of shortjaw cisco were found. Preliminary taxonomic analysis of subsets of all cisco populations demonstrated modal gillraker counts in the lake herring (*C. artedi*) range (about 43-60).

Gillraker counts from ciscoes collected in July and August 2000

Lake	n	Modal Gillraker Count	Range of Gillraker Counts
Fletcher Lake	39	45	42-50
Wylie Lake	10	46	42-49
Winnifred Lake	58	45	39-48
Dawson Lake	6	45	41-45
Bayonet Lake	28	46	42-50
Unnamed Lake	13	48	48-52
Barrow Lake - *artedi*	50	48	44-53
Barrow Lake - *zenithicus*	42*	40	35-43

*combined sample of all shortjaw cisco collected 1996-2000.

Several specimens from Winnifred Lake exhibited gillraker counts in the shortjaw cisco range (about 30-40). However, preliminary analysis of other external characters suggested that these were low gillraker variants of lake herring. The gillraker number distribution was unimodal, suggesting a single cisco population in this lake.

Recommendations/Future Direction

Barrow Lake remains the only verified population of shortjaw cisco in Alberta. Several years of sampling (14 lakes surveyed specifically for this species) clearly indicate that shortjaw cisco are rare in northeastern Alberta. Other populations may eventually be found; however, the number of occurrences in Alberta will undoubtedly remain very limited. Data are, as yet, insufficient to calculate population trends in Barrow Lake, but relative abundance and catch-per-unit-effort data suggest that the population is stable. Continued monitoring of this population is recommended.

Shortjaw cisco in Alberta should be protected from all forms of human exploitation, including commercial fishing and sportfishing and habitat degradation.

shortjaw cisco

Provincial Museum of Alberta

For more information contact:

Matt Besko *(see page 5)* and see Species at Risk Report No. 3, Distribution and relative abundance of the shortjaw cisco in Alberta.

ABUNDANCE, DISTRIBUTION AND STATUS OF SPOONHEAD SCULPIN IN THE PEMBINA RIVER

Project Supervisor: **Stephen C. Spencer**

REGION:
Northern East Slopes

TARGET SPECIES:
Spoonhead Sculpin (*Cottus ricei*)

***WILDLIFE ACT* CATEGORY:**
None

PROVINCIAL GENERAL STATUS:
May Be At Risk

purpose

To determine the status of the spoonhead sculpin within the Athabasca drainage, upstream of Whitecourt.

Background

The spoonhead sculpin is a stream-dwelling fish that is widely distributed in Alberta, including in the rivers and streams of the foothills and mountains. It is known in Alberta from the Slave, Peace, Athabasca, North Saskatchewan, upper Red Deer, Bow and upper Oldman river drainages.

Spoonhead sculpin are bottom dwellers in rocky substrate. There is some evidence that they have declined downstream of one dam in Alberta, presumably as a result of habitat degradation.

This is not a well-studied species. It is suspected that the species may not be at risk; however, a study of existing data is necessary to more accurately describe spoonhead sculpin distribution and abundance. Updated status information can be incorporated into watershed management planning to ensure habitat protection and the long-term viability of this species.

Methods

A historical data review was conducted, with an input of existing data files into the Fisheries Management Information System (FMIS).

Results

The historical data entered into the FMIS database brought the total number of spoonhead sculpin data points to 306 province-wide. Data on spoonhead sculpin were found to be abundant. Data collected by the Fish and Wildlife Division over the summer of 2000 on spoonhead sculpin will be entered into the database at a later date because they are part of an ongoing project.

The distribution of spoonhead sculpin can be clearly determined from existing data. However, population density is uncertain as the data points represent data on spoonhead sculpin from many different years. To differentiate between years and clarify the information presented for this species, it may be useful to compare the population status before and after the disturbance of the Dickson dam on the Red Deer River. This would clearly demonstrate the effects that the disturbance had on the spoonhead sculpin population and help to determine its status. It may also reveal the scope of the disturbance by showing whether connected drainages experienced a similar decline at the same time. Such a decline would be possible, due to the migration of fish species throughout the year to reach different areas for spawning, rearing, and overwintering.

Recommendations/Future Direction

Identification of water body locations and associated identification numbers, conversion and verification of positions from historical files, and the creation of distribution maps and working maps is recommended using spatial data and a Geographic Information System (GIS). Future work should be conducted on a province-wide basis instead of in a single region, to give a more accurate reflection of the status of spoonhead sculpin in Alberta. It is also recommended that data input continue for those watersheds in the Northern East Slopes that were either missed or not entered due to time constraints.

None

For more information contact:
Lisa Wilkinson *(see page 5).*

STATUS OF ST. MARY SCULPIN, SILVERY MINNOW AND STONECAT IN THE ST. MARY AND MILK RIVER DRAINAGES

Project Supervisor: **Terry Clayton**

REGION:
Prairie

TARGET SPECIES:
St. Mary Sculpin (*Cottus confusus*), Western Silvery Minnow (*Hybognathus argyritis*), Stonecat (*Noturus flavus*), Sauger (*Stizostedion canadense*) and Brassy Minnow (*Hybognathus hankinsoni*)

***WILDLIFE ACT* CATEGORY:**
None

PROVINCIAL GENERAL STATUS:
May Be At Risk: St. Mary Sculpin and Western Silvery Minnow

Sensitive: Sauger

Undetermined: Stonecat and Brassy Minnow

None

purpose

To determine the distribution, number of occurrences, and relative abundance of St. Mary sculpin, western silvery minnow and stonecat in the St. Mary River and Milk River drainages.

Background

The ichthyofauna of the Milk River basin in Alberta is poorly understood, and any collections targeting one species will provide valuable information on all fish species in the basin. The primary objective of this study was to obtain data on the distribution, relative abundance and habitat preferences of St. Mary sculpin, western silvery minnow and stonecat. A secondary focus was placed on sauger and brassy minnow.

In Alberta, the St. Mary sculpin is only found in the St. Mary River (a tributary of the Oldman River which arises in Montana) and the Milk River (a tributary of the Missouri River). It has likely expanded into the Milk River from the St. Mary River. Both the western silvery minnow and stonecat are known to occur only in the Milk River basin. Existing data is insufficient to determine population trends for these two species, but populations are believed to be stable. The western silvery minnow has been designated by COSEWIC as Special Concern.

Due to the lack of population trend information for the St. Mary sculpin, and its restricted distribution, this species should be investigated to determine its status prior to large-scale threats to its habitat. The sculpin and stonecat are bottom dwellers, living in running water with rocky substrate. The rivers in which they are found in Alberta are relatively pristine, although heavily used for irrigation.

A recurring threat in the Prairie Region is the proposed construction of a dam in the Milk River drainage for irrigation purposes. Knowledge of the presence and relative abundance of rare or uncommon fish species provides information that is valuable for decision making and land use planning. It is possible that a lack of knowledge of these species could be harmful to their existence if it leads to the inadvertent destruction of their habitat.

Methods

Methods for capture included backpack electrofishing, beach seining and traps. Fish and habitat data were entered into the Fisheries Management Information System (FMIS).

Results

In total, 4911 fish were captured in the Milk and St. Mary drainages, representing 16 fish species. Of these, 3234 fish were found in the Milk River (representing 14 species), 526 fish in the St. Mary River (7 species) and 1151 fish in Lee Creek (7 species). Of the 5 target species of concern, all were present in the Milk River. In the other 2 systems, St. Mary sculpin was the only fish species of concern located. St. Mary sculpin represented 9.7% of the species composition in the Milk River, 27.8% in the St. Mary River and 2.9% in Lee Creek. Stonecat and western silvery minnow represented 1.1% and 0.1%, respectively, of the species composition in the Milk River; sauger represented 0.6% and brassy minnow accounted for 0.3%. The relative abundance of most species varied seasonally. No changes to overall distribution patterns were found.

Recommendations/Future Direction

Data upon which to base comparisons of fish abundance between the present study and historical data were limited, particularly for western silvery minnow and stonecat. The study was also unable to identify specific habitat variables determining the distribution of the target species, although general descriptions of preferred habitat were indicated. To more accurately assess the status of these species, the authors recommend that future monitoring should be completed on a scheduled basis (every 3 years) using standardized methods, and sampling should occur during similar times of the year at representative (index) sites. More detailed studies on the distribution, abundance and habitat preferences of the western silvery minnow are required, due to its limited distribution. Additional data on the habitat preference of stonecat and St. Mary sculpin are also required in order to gain a better understanding of the key habitat variables determining their distribution and continued viability in the Milk River basin.

For more information contact:

Richard Quinlan *(see page 5)* and see RL&L Environmental Services Ltd. (in prep.) Fish species at risk in the Milk and St. Mary drainages. (Interim report for Fish and Wildlife Division)

herpetiles

LONG-TOED SALAMANDER MONITORING – ATHABASCA AND BOW VALLEY/KANANASKIS POPULATIONS

Project Supervisor: **Steve Brechtel, Lisa Takats** (ACA)

REGION:
Headquarters (conducted in Bow, Northern East Slopes)

TARGET SPECIES:
Long-toed Salamander
(*Ambystoma macrodactylum*)

***WILDLIFE ACT* CATEGORY:**
Non-game Animal
(*ESCC Recommendation: Special Concern*)

PROVINCIAL GENERAL STATUS:
Sensitive

purpose To collect long-term information on long-toed salamander distribution, and population size and trends in the Northern East Slopes and Bow regions.

Background

The Athabasca population of long-toed salamanders has recently been identified as one of four key populations. The other three populations include the Waterton area, Bow Valley and the Peace River parkland.

In order to determine the status of this species in Alberta, long-term monitoring programs that provide quantitative data on abundance and population trends are needed.

Long-toed salamander habitat is restricted, and moderate threats to its habitat have been identified. However, no evidence currently exists to suggest a decline in population or a contraction in the distribution of this species in Alberta. Due to a lack of long-term data, conclusions pertaining to the stability of the populations and range of this species are only estimates.

Possible threats to long-toed salamanders include predation by tiger salamanders and fish, drought conditions, drainage or contamination of wetlands and human land use development. Isolated populations are particularly sensitive to habitat alteration.

Methods

Drift nets with pitfall traps were set up to enable mark-recapture research. They were randomly located parallel to the shore in order to document directional movements or migration patterns.

Daytime surveys along established transects supplemented the more intensive techniques. Surveys focused on egg masses, as they were more reliably detected than cryptic larvae and adults, and provided data on population size estimates and reproductive effort. These surveys were more intensive during the time between laying and hatching, from May to June. All data obtained were stored in the Biodiversity/Species Observation Database (BSOD).

All other species of amphibians that were observed were recorded. In addition, talks were given at community schools, and interpretative programs were developed at W.A. Switzer Provincial Park and the Kananaskis Field Station.

Results

Kananaskis

Six long-toed salamanders were captured at the main survey site during 522 trap nights (Pretzlaw 2001). A great deal of salamander activity was also observed at 3 transect sites. The Lafarge Borrow Pit provided the most extensive data set. The pond was small and the substrate was light-coloured, which allowed the majority of eggs, adults and larvae to be counted. Kuhn's Pond provided numerous data on the phenology of egg hatching and larval growth. Larvae numbers at this site were estimated because the pond is large and has a dark substrate, making larvae difficult to distinguish. Data on egg laying and hatching times were recorded at East Lower Kananaskis Pond.

Hinton

One hundred and twenty-eight long-toed salamanders were captured at the main survey site during 773 trap nights. Long-toed salamander activity was highest during spring and peaked between May 21 and May 23. It should be noted, however, that breeding activity happened much earlier than is normal for the region.

Recommendations/Future Direction

Preliminary data were gathered on the status of long-toed salamanders in Alberta throughout the pilot-monitoring year. The pilot year also allowed for assessment of techniques outlined in Rice (2000), and used in Researching Amphibian Numbers in Alberta (RANA) studies. The assessment led to the formation of a standardized protocol to be used throughout Alberta. The use of a standard protocol for studying long-toed salamanders will promote the collection of comparable data province-wide, which will assist in accurate status determination.

Alberta Conservation Association, Weldwood of Canada, W.A. Switzer Provincial Park, Foothills Model Forest, Bow Valley Provincial Park, Kananaskis Field Station, Student Career Placement Program

For more information contact:

Lisa Wilkinson *(see page 5)* and see Species at Risk Report (in prep.), Alberta long-toed salamander study pilot year (2000) final report.

NORTHERN LEOPARD FROG ALBERTA INVENTORY

Project Supervisor: **Steve Brechtel, Kris Kendell (ACA)**

REGION:
Provincial (conducted in Prairie, Bow, Parkland, Northern East Slopes, Northwest Boreal, Northeast Boreal)

TARGET SPECIES:
Northern Leopard Frog (*Rana pipiens*)

***WILDLIFE ACT* CATEGORY:**
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

purpose

To determine the distribution, relative abundance and breeding success of the northern leopard frog in Alberta, using a standardized inventory protocol.

Background

The northern leopard frog was formerly widely distributed and locally abundant in the prairies, foothills and central parkland. Abrupt and dramatic population declines were noted in the late 1970s and early 1980s over much of the leopard frog's range in the west.

The causes of population declines in Alberta are not fully understood. Possible threats to existing populations and factors contributing to leopard frog declines in Alberta include viral and bacterial infections, toxic substances and introduced game fish. Threats to habitat include habitat loss and fragmentation, disturbance by livestock in riparian areas, and drought conditions leading to shallow water levels which can result in overwintering mortality if water bodies freeze to the bottom.

Previous leopard frog inventory studies have been undertaken; however, these were usually restricted to specific study areas and regions of the province. Uncertainty about the validity and reliability of some data obtained through these studies added to the impetus to conduct a province-wide inventory, using a standardized protocol. A standardized protocol was drafted in spring 2000 that focused on leopard frog behaviour, phenology and natural history requirements that would increase the productivity and efficiency of leopard frog surveys.

Alberta Conservation Association, Alberta Sport, Recreation, Parks and Wildlife Foundation, Alberta North American Waterfowl Management Plan, Summer Temporary Employment Program

Methods

Call surveys and area searches were planned; however, due to time constraints, the area search technique was the primary survey method performed at historical, current and suspected leopard frog breeding sites and overwintering locations.

Data collected during the course of the leopard frog inventory were entered into the Biodiversity/ Species Observation Database (BSOD).

Results

In total, 301 known sites were chosen to be surveyed based on leopard frog information held in BSOD. Of these 301 sites, 233 sites were investigated in 2000. For many of the sites, a broader area had to be searched because of insufficient original location information associated with those records. Of the 233 sites investigated, 49 were found to have leopard frogs of at least 1 age class. Adults were observed at 36 sites, subadults at 24 sites and young-of-the-year at 29 sites. Only a small percentage of the sites were found to have an appreciable number of frogs.

Sixty-eight sites were not surveyed due to denied access, lack of feasible access, or poor location co-ordinates. Overall conditions during the surveys were described as dry, and of the 233 sites surveyed, 22 sites were found to be completely dry. Seven of the historical records investigated were reported to be developed (residential/commercial) or eliminated. These records primarily occurred in major centres such as Calgary and Edmonton. Preliminary maps indicate that most leopard frog observations occurred along major river drainages, including the lower Red Deer River, the South Saskatchewan River, the lower Bow River and the Milk River. Leopard frogs were also observed in the Cypress Hills area, Willow Creek area (west of Stavely), and extreme northeast Alberta.

Recommendations/Future Direction

Call surveys were found to be inefficient in detecting leopard frogs due to eruptive breeding behaviour, relatively quiet calls, and sensitivity to environmental conditions that determine calling activity. It was found that surveys in late summer, coinciding with the metamorphosis of young-of-the-year frogs, were the most productive and had the added benefit of assessing the reproductive success of sites where breeding occurred. Late summer and early fall were also identified as productive survey times, as adults and other age classes began to congregate at water bodies and potential hibernation sites.

Remaining sites that were not surveyed in 2000 should be investigated in 2001. The final results of the leopard frog inventory should be cross-referenced with populations and observations noted in previous leopard frog status studies to identify possible trends at related locations. A final report will be completed in the fall of 2001.

For more information contact:

Steve Brechtel *(see page 5)*.

NORTHERN LEOPARD FROG REINTRODUCTION PROGRAM

Project Supervisor: **Steve Brechtel, Kris Kendell** (ACA)

REGION:
Provincial (conducted in Parkland)

TARGET SPECIES:
Northern Leopard Frog (*Rana pipiens*)

***WILDLIFE ACT* CATEGORY:**
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

purpose | To reintroduce northern leopard frogs into currently vacant areas of their historical range.

Background

The northern leopard frog was formerly widely distributed and locally abundant in the prairies, foothills and central parkland in the southern half of the province, but abrupt and dramatic population declines were noted in the late 1970s and early 1980s.

Highly localized remnant leopard frog breeding populations currently exist. These remnant populations are vulnerable to disturbance and degradation of habitat, which could potentially lead to further local populations becoming extirpated. This species has exhibited a very limited capacity for natural recolonization of its former distribution.

A reintroduction of this species into formerly occupied habitats would reduce its currently restricted breeding distribution and its sensitivity to environmental changes that may threaten localized populations.

This project will develop and refine techniques of captive propagation, marking, tracking and release of all age classes of leopard frog that are needed to implement a reintroduction project. It will also investigate the winter physiology and ecological requirements of the species and attempt to increase public interest in, and knowledge of, northern leopard frogs.

Methods

The 2000 captive rearing program was initiated, including monitoring the development of eggs, tadpoles and subsequent young-of-the-year (YOY). Captive-reared frogs were then marked and released into the area surrounding the Raven Brood Trout Station, near Caroline, and a proportion of the captive population was overwintered in the outdoor rearing ponds at the station. Seven adult/subadult leopard frogs were fitted with transmitters and radio tracked near the release sites of the captive-reared frogs.

Results

Four leopard frog egg masses were collected on 6 May 2000 from 3 sites in southern Alberta, near Bow City. In total, 6692 hatchling tadpoles were produced from the egg masses. Of the 1477 (minimum) YOY leopard frogs that were captive reared, 1277 were marked and released into the wild near the Raven Brood Trout Station and approximately 200 (minimum) were detained in the west-rearing pond at the facility to be over-wintered. Rearing of healthy juvenile frogs in the 2000 captive rearing program was comparable to results in the 1999 program (see table).

Results of the 1999 and 2000 captive rearing programs

	Captive rearing program 1999	2000
Total number of tadpoles	8292	6692
Total number of YOY	1430	1477
Tadpole survival metamorphosis	17.2%	22.1%

None of the seven frogs fitted with radio transmitters are known to have survived the winter. Four frogs were discovered deceased or were depredated during fall 2000. Retrieved carcasses were sent to the Canadian Cooperative Health Centre for necropsy and testing and no anomalous results were found. Spring surveys at the Raven Brood Trout Station for "surviving" frogs located 3 unattached radios and overwinter predation by mink is suspected.

Recommendations/Future Direction

The development of a leopard frog captive-breeding program involving the Calgary Zoo (a proposed expansion of the leopard frog reintroduction project) is recommended. A number of benefits would arise from a stable and reliable population of breeding frogs from which spawn could be reliably collected. In addition, a number of educational and research opportunities would arise.

Additional premium release sites in the area proximal to the Raven Brood Trout Station should be investigated, to assess potential leopard frog breeding, summering and overwintering habitat possibilities.

New sites for future leopard frog releases must possess ecological criteria supportive of leopard frog natural history such as appropriate under-ice dissolved oxygen and temperature levels, and suitable breeding and summering habitat. Ideally, sites that are void of introduced or naturally occurring predatory game fish should be selected, especially with regards to breeding habitat. The sites should also possess long-term preservation or conservation protection, and minimal disturbance or habitat degradation. Finally, new release sites that possess some degree of public access such as sites associated with provincial parks or interpretative centres would enhance public education opportunities and monitoring of released frogs.

Alberta Conservation Association, Alberta Sport, Recreation, Parks and Wildlife Foundation, Alberta North American Waterfowl Management Plan, Summer Temporary Employment Program

For more information contact:

Steve Brechtel *(see page 5)* and see Species at Risk Report No. 13, Northern leopard frog reintroduction. Raven River - year 2 (2000).

PRAIRIE RATTLESNAKE HIBERNACULUM AND POPULATION MONITORING

Project Supervisor: **Steve Brechtel, Lisa Takats** (ACA)

REGION:
Provincial (conducted in Bow, Prairie)

TARGET SPECIES:
Prairie Rattlesnake (*Crotalus viridis viridis*)

***WILDLIFE ACT* CATEGORY:**
Non-game Animal
(ESCC Recommendation: Data Deficient)

PROVINCIAL GENERAL STATUS:
May Be At Risk

purpose

To collect and review information on the overwintering sites used by the prairie rattlesnake (*Crotalus viridis viridis*) in Alberta, and develop a long-term monitoring and population analysis program.

Background

The prairie rattlesnake is found throughout much of western North America. In Alberta, this species is primarily distributed along major river drainages in the southeastern portion of the province. Historically, the prairie rattlesnake was found as far north as Trochu, and as far west as Calgary. The range has apparently contracted toward the east and south since that time, but has remained relatively unchanged since 1977.

This species has been subjected to intense persecution, and is still vulnerable to "rattlesnake roundups" in the United States. Prairie rattlesnakes are not afforded legal protection anywhere in the U.S.

The prairie rattlesnake is at the northern edge of its range in Alberta, and the availability of suitable overwintering hibernacula is likely a major factor limiting abundance and distribution. This species has a low reproductive rate, and would be slow to recover from population declines. Its reproductive biology dictates that any program designed to monitor population trends must be long-term, but to this point no standardized, long-term information has been collected.

Current threats to this species include the loss of native grassland habitat, mortality associated with industrial development, and intentional killing of snakes and destruction of den sites.

Methods

A literature review and correspondence with researchers in the region were conducted to gather all known information on prairie rattlesnakes. This information was used to create 1:50 000 scale maps suitable for field use, and a 1:350 000 scale regional overview map, which profiled hibernacula and individual snake observations.

Known hibernacula were visited during late summer 2000 to confirm their persistence. Information was collected on habitat, den description, and possible threats. Searches for new den sites were also conducted.

A proposal was developed for monitoring in the spring of 2001, which could include Passive Integrated Transponder (PIT)-tagging snakes at two dens (multi-use and low-use), and working in co-operation with other snake studies that are occurring.

Results

An abbreviated field season precluded the assessment of all known sites. However, an effort was made to use current information from other recent rattlesnake studies in areas along the Red Deer, South Saskatchewan and Oldman river valleys. In total, 96 hibernaculum sites were mapped and placed in a data file. An effort was made to group any duplicated historical sites together in the new file.

Ten hibernacula were visited in areas along the South Saskatchewan, Oldman and Bow river valleys to confirm recent rattlesnake activity. Five new hibernacula (4 from the South Saskatchewan River valley and 1 on the Oldman River valley) were also assessed. Fish and Wildlife Division staff visited 15 sites along the Red Deer River valley to obtain current information on rattlesnake activity. Fifty-one incidental observations of rattlesnakes in the Oldman, South Saskatchewan and Red Deer river valleys have been added to the data file and maps.

Recommendations/Future Direction

A long-term monitoring program could be established as either a standardized observational monitoring program of multiple sites, or a more intensive population analysis of representative sites in the province. Presence/absence or abundance data could be collected annually over a five-year period, and then at a less frequent interval. Population estimates and characteristics may then be extrapolated from the results and compared over time.

Future research or study regarding the prairie rattlesnake should concentrate on gathering standardized, long-term information with regard to hibernaculum sites and rattlesnake activity. Remote sensing and land stratification techniques may be applied to help locate hibernacula and birthing rookeries. Standardized information on historical and new hibernaculum sites will enable more accurate status determination and aid in the management of this species.

Alberta Conservation Association

For more information contact:

Joel Nicholson *(see page 5)* and see Species at Risk Report (in prep.), Prairie rattlesnake (*Crotalus viridis viridis*) monitoring in Alberta – pilot year (2000).

PRAIRIE RATTLESNAKE INVENTORY

Project Supervisor: **Dale Eslinger, Joel Nicholson**

REGION:
Prairie

TARGET SPECIES:
Prairie Rattlesnake (*Crotalus viridis viridis*)

***WILDLIFE ACT* CATEGORY:**
Non-game Animal
(ESCC Recommendation: Data Deficient)

PROVINCIAL GENERAL STATUS:
May Be At Risk

purpose

To refine a habitat stratification process used to identify likely locales for rattlesnake hibernacula, within a study area along the South Saskatchewan River.

Background

The prairie rattlesnake is found throughout much of western North America. In Alberta, this species is primarily distributed along major river drainages in the southeastern portion of the province. Historically, the prairie rattlesnake was found as far north as Trochu, and as far west as Calgary. The range has apparently contracted toward the east and south since that time, but has remained relatively unchanged since 1977.

This species has been subjected to intense persecution, and is still vulnerable to "rattlesnake roundups" in the United States. Prairie rattlesnakes are not afforded legal protection anywhere in the U.S.

The prairie rattlesnake is at the northern edge of its range in Alberta, and the availability of suitable overwintering hibernacula is likely a major factor limiting abundance and distribution. This species has a low reproductive rate, and would be slow to recover from population declines. Its reproduction biology dictates that any program designed to monitor population trends must be long-term.

Current threats to this species include the loss of native grassland habitat, mortality associated with industrial development, high levels of road mortality, and intentional killing of snakes and vandalism of den sites.

Methods

The project was designed using a technique derived from an air photo study that was developed in 1997 by Corporate Management Services, Prairie Region. Attributes of known active snake hibernacula were used to classify the study area into High, Medium, Low and Unlikely strata. Predicted locations of hibernacula were then ground-truthed. A foot search of the coulee complexes was conducted in the spring before snake dispersal and during the late summer as the snakes came back in preparation for winter. Additional potential sites were also located during the summer and revisited in the fall to check for presence of snakes. The hibernacula were pinpointed using Global Positioning System (GPS) units, and aerial photographs were used for further reference. Unlikely areas were also searched for the presence of snake dens as a means of evaluating the habitat stratification methodology.

Results

The original air photo stratification process identified approximately 85 percent of the study area as unlikely to contain snake hibernacula. A total of 8 snake dens was located within the study area: 2 in the High stratum, 1 in the Medium stratum, 3 in the Low stratum, and 1 in the Unlikely stratum. Of these sites, 7 were previously unknown sites found within the course of the study.

Dens varied in size and number of snakes, and some dens contained young of the year—a sign of good health for the den. It is also notable that at 1 of the larger den sites, construction of a natural gas pipeline was imminent. This pipeline was subsequently re-routed and the den was saved. Other dens were located in close proximity to roads and trails constructed by the oil and gas industry. Snake mortality was documented along these routes, which parallel the South Saskatchewan River valley.

Recommendations/Future Direction

Overall, the air photo interpretation methodology used in this project seems to be a valuable tool to increase the efficiency of searching for rattlesnake hibernacula.

Recommendations coming out of this project are as follows:

1) Work on refinement of the predictive tool to improve accuracy and reliability.
2) Expand this type of project range-wide so that a more extensive search of hibernacula can be conducted throughout the major river valleys in southern Alberta.
3) Place adequate levels of protection on all den sites to provide year-round security.
4) Monitor located sites over the long term to assess survival and population trend.

Local ranches

For more information contact:

Joel Nicholson *(see page 5)* and see Species at Risk Report No. 22, Utilization of air photo interpretation to locate prairie rattlesnake (*Crotalus viridis viridis*) hibernacula in the South Saskatchewan River valley.

RED-SIDED GARTER SNAKE RELOCATION PROJECT

Project Supervisor: **Steve Brechtel, Lisa Takats** (ACA)

REGION:
Headquarters

TARGET SPECIES:
Red-sided Garter Snake
(*Thamnophis sirtalis*)

WILDLIFE ACT CATEGORY:
Non-licence Animal

PROVINCIAL GENERAL STATUS:
Sensitive

CONTRIBUTING AGENCIES

Alberta Conservation Association, Alberta Ecotrust, Alberta Sport, Recreation, Parks and Wildlife Foundation

For more information contact:

Steve Brechtel *(see page 5)*.

purpose

To determine the fidelity of relocated snakes to the new den site and the population size, and to refine snake counting techniques.

Background

The red-sided garter snake occurs scattered throughout Alberta, but is found most frequently in the boreal forest and aspen parkland. The provincial population is thought to be stable, but information on population trends is lacking.

Potential threats to populations of red-sided garter snakes include direct killing, collection and roadside mortality. Potential threats to the species' habitat include oil and gas exploration, gravel extraction, road and bridge construction, urban sprawl, and destruction of den sites.

Relocation of snakes from one den to another has been addressed with limited attention and trial. Traditionally, snakes and hibernacula have been considered a nuisance, and were often destroyed on private land. These problems could be limited following the development of effective translocation techniques resulting from this project, where red-sided garter snakes were relocated from a hibernaculum on private property to a nearby, but more remote hibernaculum.

Methods

Initiated in September 1998, snakes were captured using funnel traps and relocated to another occupied den site. All relocated snakes were marked using Passive Integrated Transponder (PIT) tags (large snakes only) and scale clipping. Spring and fall counts were conducted over the course of the study, including 2000-2001, to determine occupancy at both sites and return rate at the new site.

The final season for the project will occur in spring 2001, and will include searching for other dens in the area and a final count at the new site.

Results

A total of 1190 garter snakes was relocated to a den 10 km away that contained approximately 8000 snakes. Relocations took place in the fall of 1998 (282 snakes), the spring of 1999 (341 snakes) and the fall of 1999 (567 snakes). A total of 30% of the snakes that were relocated were recaptured at the new site in spring 2000. Resident snakes at the new den showed a 32% return rate. Size class measures show the new den to contain a normal distribution of sizes.

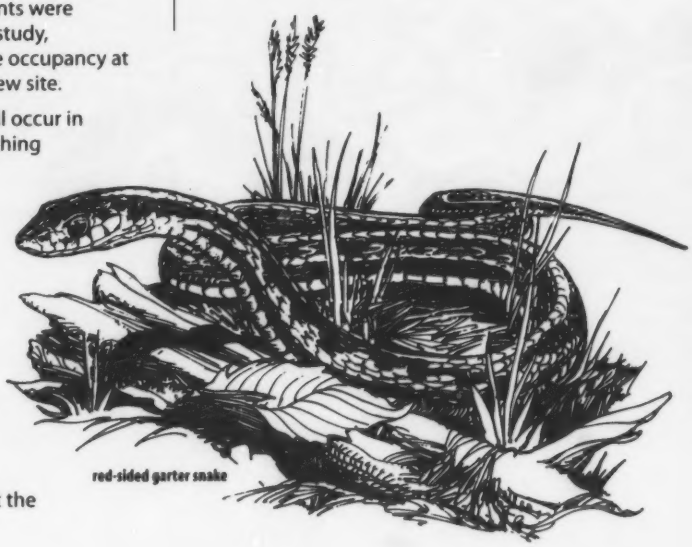
Education projects included talks, posters, field trips, media events and the proposal of another snake den management program. The new Snakes of Alberta poster was printed, and will help to increase public knowledge about snakes and their environments.

Recommendations/Future Direction

The results suggest that red-sided garter snakes can be successfully captured by funnel traps and relocated. Certain factors should be kept in mind during a relocation effort, including not moving snakes over too great a distance (so as to minimize differences in habitat between locations) and ensuring that the new site has good summer habitat in the same cardinal direction in which snakes dispersed from the old site.

Determining population estimates at a den can be difficult, and it is recommended that it may be necessary to catch all snakes or determine the numbers and sizes of breeding balls.

Management guidelines will be included in the final Species at Risk report, to be produced in the fall of 2001.



red-sided garter snake

ALBERTA AMPHIBIAN DISTRIBUTION AND PRELIMINARY TRENDS

Project Supervisor: **Steve Brechtel, Lisa Takats** (ACA)

purpose To produce updated distribution maps of all of the amphibians of Alberta, and to determine population trends of species captured at RANA sites.

Background

Over the last 50 years, many species of amphibians and reptiles throughout the world have declined, and in some cases have become extirpated or extinct. These declines can be attributed to a number of issues: habitat destruction, pollution (e.g., fertilizers, pesticides, herbicides, acid precipitation), ionizing radiation (UV-B), pathogens, exotic competitors, predators and road kills.

Long-term population monitoring and current information on distribution are necessary to determine the status of amphibian species in Alberta. Amphibian population monitoring has been ongoing in Alberta since 1997 with the inception of the Researching Amphibian Numbers in Alberta program (RANA), organized by the Fish and Wildlife Division and the Alberta Conservation Association. Additionally, distributional data have been collected by the Alberta Amphibian Monitoring Program (AAMP) since 1992.

Methods

Information on amphibian distribution was acquired from a variety of sources including volunteer data from the AAMP, RANA and other research projects, and the Biodiversity/Species Observation Database (BSOD). Distribution maps were prepared using ArcView. Preliminary population data were also summarized for species trapped at RANA sites.

Results

Population trends will be examined for all species observed at RANA sites for at least three consecutive years. The following table summarizes capture rates for these species at five RANA sites.

Capture rate (number of individuals per trap night) for eight amphibian species observed at RANA sites for at least three consecutive years

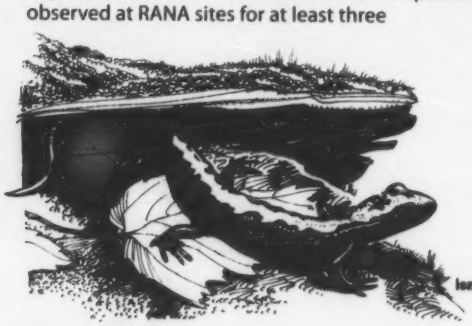
Species	Site	1997	1998	1999	2000
Boreal Chorus Frog	Beaverhill Lake		0.0082	0.0008	0.0110
	Cypress Hills		0.0110	0.0043	0.0010
	Lesser Slave Lake	0.0150	0.0014	0.0170	0.0080
	Meanook	0.0070	0.0053	0.0032	0.0030
Boreal Toad	Kananaskis		0.0310	0.0290	0.0057
	Lesser Slave Lake	0.0100	0.0067	0.0340	0.2600
	Meanook	0.0058	0.4500	0.0100	0.0600
Canadian Toad	Lesser Slave Lake	0	0.0003	0	0
Columbia Spotted Frog	Kananaskis		0.0066	0.0052	0
Long-toed Salamander	Kananaskis		0.1700	0.0260	0.0110
Northern Leopard Frog	Cypress Hills		0.0280	0.0220	0.0100
Tiger Salamander	Beaverhill Lake		0.0005	0.0008	0
	Cypress Hills		0.1700	0.0130	0.0100
Wood Frog	Beaverhill Lake		0.0880	0.0880	0.0750
	Kananaskis		0.0570	0.0310	0.0057
	Lesser Slave Lake	0.1070	0.0095	0.0360	0.0160
	Meanook	0.3700	0.3700	0.0400	0.0170

Distribution maps were generated for each species in ArcView and will be shared with regional biologists.

Recommendations/Future Direction

It is apparent that the annual population size for many amphibian species is variable. A continuation of data collection is therefore needed, in order to determine trends and to distinguish them from natural fluctuations. This would also enable multi-year coverage of all RANA sites, as some have only one or two years of data. Other strategies may have to be developed to capture information for great plains toad and plains spadefoot, as these species are very eruptive and are not well documented at RANA sites. RANA sites should be set up for Canadian toad.

A comprehensive assessment of the Alberta Amphibian Monitoring and Researching Amphibian Numbers in Alberta programs, as well as preliminary population trends, will be presented in a report to be released fall 2001.



long-toed salamander

REGION:
Provincial (conducted in Headquarters)

TARGET SPECIES:
Canadian Toad (*Bufo hemiophrys*), Columbia Spotted Frog (*Rana luteiventris*), Great Plains Toad (*Bufo cognatus*), Long-toed Salamander (*Ambystoma macrodactylum*), Northern Leopard Frog (*Rana pipiens*), Plains Spadefoot (*Spea bombifrons*), Boreal Toad (*Bufo boreas*), Boreal Chorus Frog (*Pseudacris maculata*), Tiger Salamander (*Ambystoma tigrinum*) and Wood Frog (*Rana sylvatica*)

WILDLIFE ACT CATEGORY:
Threatened: Northern Leopard Frog

Non-game Animals: Canadian Toad, Columbia Spotted Frog, Great Plains Toad, Long-toed Salamander and Plains Spadefoot

Non-Licence Animals: Boreal Toad, Boreal Chorus Frog, Tiger Salamander and Wood Frog

(ESCC Recommendation – Special Concern: Long-toed Salamander)
(ESCC Recommendation – Data Deficient: Canadian Toad and Great Plains Toad)

PROVINCIAL GENERAL STATUS:
At Risk: Northern Leopard Frog

May Be At Risk: Canadian Toad, Great Plains Toad and Plains Spadefoot

Sensitive: Columbia Spotted Frog and Long-toed Salamander

Secure: Boreal Chorus Frog, Boreal Toad, Tiger Salamander and Wood Frog

COOPERATING AGENCIES

Alberta Conservation Association, Beaverhill Bird Observatory, Student Career Placement Program

For more information contact:

Steve Brechtel *(see page 5)*.

BROOKS AREA RARE HERPETILE MONITORING PROGRAM

Project Supervisor: **Ed Hofman**

REGION:
Bow

TARGET SPECIES:
Northern Leopard Frog (*Rana pipiens*), **Canadian Toad** (*Bufo hemiophrys*), **Great Plains Toad** (*Bufo cognatus*), **Plains Hognose Snake** (*Heterodon nasicus*), **Prairie Rattlesnake** (*Crotalus viridis viridis*) **and Plains Spadefoot** (*Spea bombifrons*)

WILDLIFE ACT CATEGORY:
Threatened: Northern Leopard Frog

Non-game Animals: Canadian Toad, Great Plains Toad, Plains Hognose Snake, Prairie Rattlesnake and Plains Spadefoot

(ESCC Recommendation – Data Deficient: Prairie Rattlesnake, Canadian Toad and Great Plains Toad)

PROVINCIAL GENERAL STATUS:
At Risk: Northern Leopard Frog

May Be At Risk: Canadian Toad, Great Plains Toad, Plains Hognose Snake, Prairie Rattlesnake and Plains Spadefoot

Dinosaur Provincial Park

For more information contact:

Arlen Todd *(see page 5)*.

purpose

To enhance existing knowledge of rare or threatened Alberta herpetiles for improved management of the species and their habitats, focusing on the area of the Red Deer River and all associated tributaries and major creek systems.

Background

Over the last 50 years, many species of amphibians and reptiles throughout the world have declined, and in some cases have become extirpated or extinct. These declines can be attributed to a number of issues: habitat destruction, pollution (e.g., fertilizers, pesticides, herbicides, acid precipitation), ionizing radiation (UV-B), pathogens, exotic competitors, predators and road kills.

Studying the distribution and determining population trends of amphibian and reptile species in Alberta will aid in determining the status of these species. Through the identification of sensitive herpetile habitats, it will be possible to develop programs for the purposes of habitat protection.

Methods

An inventory for leopard frogs at known breeding sites in the Calgary and Brooks areas was conducted. An extensive literature review was carried out to determine possible new locations and discover historical populations of the other herpetile species indicated. The Biodiversity/ Species Observation Database (BSOD) and the Alberta Natural Heritage Information Centre (ANHIC) were also used for this exercise.

Known prairie rattlesnake and plains hognose snake winter hibernacula were visited to determine if they were currently being used, and landowners living in the range of the species of concern were interviewed to obtain further information. Experts and Fish and Wildlife Division staff were also consulted for further information.

Results

The 2000 herpetile project conducted in the Brooks area was divided into two separate ventures. An extensive amphibian inventory was conducted during the spring and summer, and a snake hibernaculum search was conducted during the fall months.

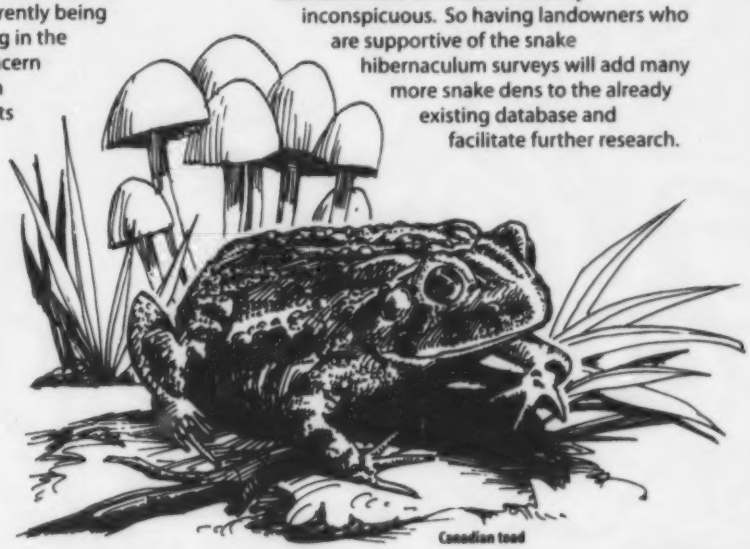
Observations of note were 48 northern leopard frogs, including 16 young-of-the-year and 3 subadults. In addition, 8 active snake hibernacula were located, at which bull snake, plains garter snake, prairie rattlesnake and wandering garter snake were observed.

Recommendations/Future Direction

The easiest and most efficient way of conducting accurate wetland frog and toad censuses is to survey during the calling season (early April to June). All field season elements should be in place at the initiation of the calling season in order to maximize efficiency.

The summer of 2000 was one of the driest on record since the drought of the mid-80s. Therefore, the 2000 amphibian surveys may have been skewed slightly because of the lack of water and breeding ponds.

The prairie rattlesnake remains a poorly understood species in Alberta, and it is important to inform the people living in snake habitats about the role of rattlesnakes in the prairie ecosystem. It is of equal importance to gain the trust of the people living in snake country and to establish a working relationship with them. This is particularly true because snake dens are essentially inconspicuous. So having landowners who are supportive of the snake hibernaculum surveys will add many more snake dens to the already existing database and facilitate further research.



Canadian toad

mammals

CROWSNEST GRIZZLY LINKAGE STUDY

Project Supervisor: **Richard Quinlan**

purpose To determine the importance of the Crowsnest Pass as a linkage corridor for the continental grizzly population.

REGION:
Prairie

TARGET SPECIES:
Grizzly Bear (*Ursus arctos*)

WILDLIFE ACT CATEGORY:
Big Game

PROVINCIAL GENERAL STATUS:
May Be At Risk

Background

The grizzly bear experienced a major range reduction and decline in numbers with the settlement and development of Alberta. However, population levels may have been increasing steadily on public land since the late 1980s. This species is currently under a very restrictive sport-hunting regime.

Threats to grizzly bears include increased contact with people through development and recreational activities. However, the greatest threat is loss and degradation of wilderness habitats through resource extraction and recreational development.

The Crowsnest Pass has been identified by the Rocky Mountain Grizzly Planning Committee as a critical continental linkage for grizzly bears, in jeopardy of being lost. It is imperative to assess the habitat use and effectiveness of identified movement corridors for large carnivores, including grizzly bear and cougar, in order to direct habitat protection and land acquisition initiatives.

Methods

During the year 2000, a University of Alberta PhD student prepared a study design which included Global Positioning System (GPS) collaring of grizzlies. Funding partners are being solicited for this project, and the field component will begin in 2001.

Results

A literature review of carnivore biology and conservation, responses of grizzly bears and cougars to human activities, and wildlife corridors for bears and cougars was completed. A detailed proposal for assessing the location and utility of wildlife corridors for grizzly bears and cougars in the Crowsnest Pass was also developed.

Recommendations/Future Direction

Field work implementing the developed proposal is to begin in 2001. Data on resource selection and movement patterns of grizzly bears and cougars in the Crowsnest Pass will be collected through the collaring of five grizzlies and five cougars in the study area with GPS units. An index of potential ungulate prey density for the study area will be determined through the compilation of existing distribution and survey data for elk and bighorn sheep in the Crowsnest Pass. Spatially explicit habitat and movement models will be developed to map the probability of occurrence of grizzly bears and cougars given current landscape conditions. Confirmation of movement corridors for carnivores will allow for mitigation of a proposed highway twinning project, plus residential and recreational developments.

Southwestern Alberta Grizzly Strategy (Alberta Conservation Association), Nature Conservancy of Canada, Rocky Mountain Elk Foundation

For more information contact:

Richard Quinlan *(see page 5)* and see Chetkiewicz, C. 2001. Carnivores and corridors in the Crowsnest Pass. (Interim report for Fish and Wildlife Division)

FOOTHILLS MODEL FOREST GRIZZLY BEAR RESEARCH PROJECT

Project Supervisor: **Gordon Stenhouse**

REGION:
Northern East Slopes

TARGET SPECIES:
Grizzly Bear (*Ursus arctos*)

WILDLIFE ACT CATEGORY:
Big Game

PROVINCIAL GENERAL STATUS:
May Be At Risk

purpose To provide resource managers with the knowledge and planning tools necessary to ensure the long-term conservation of grizzly bears in the Alberta Yellowhead ecosystem.

Background

The grizzly bear experienced a major range reduction and decline in numbers with the settlement and development of Alberta. However, population levels may have been increasing steadily on public land since the late 1980s, and there may be a small population increase in the southern portion of the Peace River area. This species is currently under a very restrictive sport-hunting regime.

The largest threat facing grizzly bears in Alberta and in fact all of North America is the loss and fragmentation of preferred habitat. The primary reason for this loss and fragmentation is the increasing use of grizzly bear habitat by humans.

This project will help in developing and testing Geographic Information System (GIS) based decisions. The data collected within this project will ultimately allow managers to set and establish landscape thresholds for various human activities within this region. We anticipate that many of the products developed in this program will be transferable to other grizzly bear habitats in Alberta.

Methods

Twenty-five adult grizzly bears were captured and radio-collared with Global Positioning System (GPS) collars and very high frequency (VHF) ear tag transmitters to monitor movements, habitat use and den sites within the study area.

Working with collaborative researchers, a Landsat-based grizzly bear habitat map was prepared for the study area and its accuracy was verified through ground sampling and the use of GPS bear movement data. The goal of this component was to quantify the structure of the existing landscape and to document landscape change over time on an annual basis.

In conjunction with researchers at the University of Alberta, resource selection function (RSF) models will be developed to understand the relationship between habitat and grizzly bear numbers and distribution in the study areas. This component of the grizzly bear project will continue in 2001.

Additionally, results of the two DNA inventory techniques used in the 1999 field season were compared for utility and effectiveness in providing long-term population trend information.

Results

In 2000, 37 bears were handled, of which 25 were grizzly bears and 12 were black bears. Included in the number of grizzly bear captures was 1 handling mortality that took place within Jasper National Park during snaring operations. No non-target species were caught in snares. In total, 21 of the captured grizzly bears were radio collared and were used to study bear movements during the second field season. We recaptured and re-collared 12 bears that were collared during the first year of this program. Bears were captured in all but two of the 16 designated bear management units in our core study area.

Of the 21 collars deployed, 14 have been retrieved. Currently, there are 7 bears collared. Three of these bears have had their original collar replaced with a new one and 4 bears continue to wear their original collar. The location of 3 other bears and the status of their collars is unknown. Fifteen bears still have their ear tag transmitters attached and working. A total of 7699 locations have been collected from 19 bears (13 females and 6 males) in 2000. These locations include all data both from retrieved collars and uploads. In 2000, the sample size per bear ranged from 35 - 919 locations. This large variation was primarily a result of some bears dropping their collars shortly after capture and individual collar performance. Collars remained on the bears between 22 and 210 days.

The annual 100% minimum convex polygon (MCP) home ranges were calculated using the Animal Movement Extension (Hooge and Eichenlaub 1997) for ARCVIEW GIS (ERSI Inc.). See table for the average home range size for both sexes across years. It should be noted that some collars had fallen off bears early in the season and consequently annual home ranges for these animals will be severely underestimated. Also, the

Annual 100 MCP home ranges for collared bears in the grizzly bear research program area in 1999 and 2000

	1999		2000		1999/2000	
	Mean (km^2)	Range (km^2)	Mean) (km^2)	Range (km^2)	Mean (km^2)	Range (km^2)
Female	671	102-2049	832	73-2980	668	471-1090
Male	962	436-1588	1611	217-3643	1733	1165-2406

multi-annual home ranges for 1999 and 2000 combined were calculated only for bears with 2 years' worth of data.

Recommendations/Future Direction

Results of the DNA hair sampling work to date have shown a lack of precision, some of which may be due to capture bias and/or study boundary closure issues. Future work on this problem is focusing on looking at GPS movement data to understand these issues and looking at sampling designs which may overcome these problems.

Results of our GPS movement data are being analyzed to investigate the relationships between habitat quality issues and human use parameters in relation to home range size and habitat use. More data will be required (and are being collected) to further investigate the preliminary findings we have seen to date.

As there is some uncertainty about the long-term utility of DNA census approaches, we are now pursuing other measures of animal health (reproduction and stress levels) and trying to relate these to landscape conditions and human activity within the study area.

Remote sensing work is proceeding, with a focus on developing mapping applications to identify important grizzly bear habitat across large land areas. We are also tracking landscape change (e.g., fragmentation due to new roads, cutblocks) to understand bear response to changing landscape conditions.

Our program has gathered over 15 000 bear locations in the past two years and we now have the most comprehensive database on grizzly bear movements in North America. The utility and advantage of GPS radio collars have been demonstrated in the first two years of this five-year study.

grizzly bear

COOPERATING AGENCIES

Foothills Model Forest, Weldwood of Canada, Alberta Conservation Association, Cardinal River Coals, Ainsworth Lumber, TransCanada Pipelines, Inland Cement, Jasper National Park, Telemetry Solutions, Luscar, Petro-Canada, Sundance Forest Products, Gregg River Resource, Weyerhaeuser Canada

For more information contact:

Lisa Wilkinson *(see page 5)*.

NORTHWEST BOREAL REGION GRIZZLY BEAR PROGRAM - DATA CONSOLIDATION, REGISTRY DEVELOPMENT AND GRIZZLY BEAR DEPREDATION/MORTALITY STUDY

Project Supervisor: **Dave Moyles, Dave Hervieux, Mark Heckbert**

REGION:
Northwest Boreal

TARGET SPECIES:
Grizzly Bear (*Ursus arctos*)

WILDLIFE ACT CATEGORY:
Big Game

PROVINCIAL GENERAL STATUS:
May Be At Risk

None

For more information contact:

Adam James *(see page 5)* and see Species at Risk Report No. 10, An evaluation of grizzly bear - human conflict in the Northwest Boreal Region of Alberta (1991 to 2000) and potential mitigation.

purpose

To consolidate all current knowledge of grizzly bears and their distribution within the Northwest Boreal Region and to identify the stewardship actions most likely to contribute to the conservation of grizzlies in the region.

Background

Grizzly bears occur in all three management areas within the Northwest Boreal Region, as determined by verified sightings and registrations of grizzly bear mortalities. Sightings have increased in some portions of the region, such as the Marten Hills and the west end of Wildlife Management Unit (WMU) 357.

The west portion of WMU 357 is a mosaic of public land and private farms and ranches. The public land is excellent bear habitat, but grizzly bears wander onto private land periodically, presenting many problems, including issues of public safety and grizzly bear depredations. Public opinion appears to have shifted somewhat from one of active killing of bears to one of tolerance. However, every year Fish and Wildlife Division (FWD) staff have to trap grizzlies from private land. These bears are either relocated or destroyed, depending on the situation. If no management measures are taken, the need to trap and relocate bears will be an ongoing problem. The current situation needs to be evaluated to determine if various remedial measures such as domestic carcass removal and public education concerning bears and farming practices would be effective in this situation.

Methods

All FWD occurrence reports for the region since 1991 were reviewed and all grizzly bear records were entered into the Biodiversity/Species Observation Database (BSOD). Grizzly hair samples were collected in the region whenever possible and submitted to the FWD DNA lab so that a library of grizzly bear DNA profiles can be developed over time.

The potential for application of remedial measures was investigated for the western portion of WMU 357. A stewardship program was developed in consultation with local landowners to minimize the number of bear attractants on private lands.

Results

A total of 375 grizzly bear occurrences from the last 10 years were reviewed. Of the 375 occurrences, 184 (49%) were sightings. For the majority of sightings (93%), the cause of the bear's presence was unknown. The other 191 (51%) occurrences were related to human-bear conflict on either private or public land. For these occurrences, 20% of the causes were unknown. Human-bear conflicts led to the destruction of a total of 34 bears, mostly by the complainants, and the translocation of 16 bears.

Recommendations/Future Direction

The results of this study stress the need for effective long-term solutions to prevent and eliminate the sources of human-bear conflict in order to negate problem bear behaviour now and in the future. Development of a management plan should include a bear awareness education program that would educate citizens to reduce unnatural food attractants, and provide information for co-existing with bears. Moreover, it would provide citizens with alternative strategies and resources, such as bear-resistant trash containers, that would reduce the availability of unnatural attractants. Following that, aversive conditioning techniques could be used on nuisance bears to alter undesirable behaviour, to instil a fear of humans, and to avoid the removal or destruction of bears. Additionally, a carcass pick-up service would immediately remove and properly dispose of domestic and wild animal carcasses from the core problem areas.

Part of the management strategy would consist of the establishment of a local task force. The role of the task force would be to secure a cooperative effort with landowners by understanding their interactions with bears and, in turn, to develop ways to help landowners and bears co-exist. In addition, landowners need to be provided with information on good livestock management practices. Lastly, the management strategies would involve research to understand grizzly behaviour and habitat use while further examining human-bear relationships and ways to reduce conflict. Application of the above strategies would reduce human-bear conflicts, reduce the numbers of bears relocated or destroyed, and reduce human impact on the health and population dynamics of grizzly bears.

REGIONAL GRIZZLY BEAR MANAGEMENT PLAN

Project Supervisor: **Jon Jorgenson**

REGION:
Bow

TARGET SPECIES:
Grizzly Bear (*Ursus arctos*)

WILDLIFE ACT CATEGORY:
Big Game

PROVINCIAL GENERAL STATUS:
May Be At Risk

purpose

To develop a grizzly bear management plan that promotes long-term viability of the species in the Bow Region.

Background

The grizzly bear experienced a major range reduction and decline in numbers with the settlement and development of Alberta. However, population levels may have been increasing steadily on public land since the late 1980s, and there may be a small population increase in the southern portion of the Peace River area. This species is currently under a very restrictive sport-hunting regime.

Threats to grizzly bears include increased contact with people through development and recreational activities. However, the greatest threat is loss and degradation of wilderness habitats through resource extraction and recreational development.

Monitoring of this species will allow researchers to identify mitigative actions that could be implemented to reduce grizzly mortality, promote adequate secure areas, and reduce human/bear conflicts in the Bow Region.

Methods

A draft management plan, containing appropriate analyses and content, was prepared by a wildlife consultant.

Results

The Bow Region Grizzly Bear Management Plan is designed to be a comprehensive field implementation plan containing a review of historical and current information on habitat status, population status, human/bear conflict issues and data gaps, and recommendations to reduce human-caused bear mortality.

Recommendations/Future Direction

It is anticipated that this plan will be used in a more comprehensive strategic framework planning process, involving multiple stakeholders from industry, Parks Canada and provincial government agencies.

None

For more information contact:

Arlen Todd *(see page 5)* and see Species at Risk Report (in prep.), Draft grizzly bear management plan for the Bow Region.

POPULATION DEMOGRAPHY, DISTRIBUTION AND SEASONAL ACTIVITIES OF ORD'S KANGAROO RATS

Project Supervisor: **David Gummer** (Provincial Museum of Alberta)

REGION:
Provincial (conducted in Prairie)

TARGET SPECIES:
Ord's Kangaroo Rat (*Dipodomys ordii*)

WILDLIFE ACT CATEGORY:
Non-game Animal
(ESCC Recommendation: Endangered)

PROVINCIAL GENERAL STATUS:
May Be At Risk

purpose

To monitor the Alberta kangaroo rat population and its local distribution in the Middle Sand Hills, quantify the extent of endemic (unique) characteristics, and investigate the potential impacts of industrial developments on the survival and activities of kangaroo rats.

Background

Ord's kangaroo rats are small, nocturnal rodents that are highly adapted for survival in desert environments. They occur in Alberta at the northernmost periphery of the species' range and are geographically isolated from more southern conspecifics. The Alberta population has a small distribution and appears to possess endemic characteristics (e.g., hibernation) that are not known in any other population of kangaroo rats.

In Alberta, this species is known to occur only in the Middle Sand Hills area, including the eastern portion of Canadian Forces Base Suffield and adjacent areas between the South Saskatchewan and Red Deer rivers. The natural habitats of kangaroo rats are actively eroding sand dunes, which are uncommon and threatened by encroachment of dense vegetation and increasing human developments. Kangaroo rats also opportunistically inhabit disturbed areas such as fireguards, roads, or trails; however, these habitats may artificially increase encounter rates with predators, parasites, poor quality food items and difficult winter conditions, relative to kangaroo rats that occupy natural sand dunes.

Overwinter survival of Alberta kangaroo rats is typically very low (approximately 10%); the breeding population crashes to a seasonal minimum of less than 1000 individuals each spring. Hence, the long-term persistence of this unique mammal in the province is not secure and the species needs to be monitored and better understood.

This research will complement a preceding study (1994 to 1999) and facilitate analysis of long-term population variation.

Methods

Field surveys consisted of nighttime spotlighting transects on foot and using 4WD vehicles, to search for kangaroo rats in open, sandy habitats. All kangaroo rat observations were georeferenced using a hand-held Global Positioning System (GPS) unit.

Kangaroo rats were pursued on foot and caught by hand. Individuals were identified by attaching a numbered, metal ear tag and by implanting a subcutaneous microchip. Sex, age class, reproductive stage, parasite status, and body mass were recorded for each kangaroo rat that was enumerated.

During late autumn, a small subsample of the study population was implanted with miniature temperature recorders (dataloggers; 3 g) to monitor winter hibernation patterns. For implantation of the devices, kangaroo rats were anaesthetized using isoflurane and surgery was conducted under standard sterile conditions. Upon recovery from surgery, the implanted animals were released in their home territories.

Follow-up surveys were conducted during early spring 2001 to assist in assessment of overwinter survival (2000-2001) and early spring above ground activity patterns, as well as to attempt recovery of temperature recorders from implanted kangaroo rats.

Georeferenced observations of kangaroo rats and other rare or endangered nocturnal species in

Ord's kangaroo rat

the Middle Sand Hills were entered into the Biodiversity/Species Observation Database (BSOD).

Results

One hundred and twenty-six person-nights of surveys for kangaroo rats resulted in 715 georeferenced observations of kangaroo rats, consisting of 550 capture records and 165 other records, including burrows/tracks and direct observations of kangaroo rats escaping into their burrows.

In 2000, 320 individual kangaroo rats were enumerated: 186 were adults that had survived the preceding winter and 134 were young of the year. Fifty-five adults had been marked during previous years of study. Forty-four individuals were enumerated during early spring 2001, of which 37 were adults and 7 were young of the year. To date, 11 kangaroo rats caught in 2001 were adults that had been marked during preceding years of study. Early spring surveys in 2001 discovered that the first young of the year had emerged by 23 March, which was 30 days earlier than the earliest known emergence of juveniles in any previous year (1994 to 2000).

Minimum overwinter survival during 1999/2000 was 16% (n = 353). Surveys during 2000 and early spring 2001 suggest that minimum overwinter survival during the subsequent year was at least 8% (n = 170). Analysis of the long-term dataset showed that overwinter survival of females was highly variable among years, but overwinter survival of males was more consistent among years. Of the 1794 individuals that have been enumerated since 1994, the maximum known longevity was an uncommon 3 years of age (n = 12) and a life span of 2 years of age was also rare (n = 127).

In 2000, kangaroo rats were parasitized by botfly larvae between 1 July and 26 August. During that period, 20% of kangaroo rats were parasitized by 1-4 botfly larvae. Each sex and age class was equally likely to be parasitized by botfly larvae. Male kangaroo rats that were parasitized by botfly larvae abandoned current reproduction whereas females persevered with the current reproductive effort regardless of botfly parasitism.

Diet samples (n=258) were collected from kangaroo rats' cheek pouches and these samples were submitted to the Provincial Museum of Alberta for identification and analysis.

An implanted body temperature recorder was recovered from 1 kangaroo rat during early spring 2001. It contained 3783 hourly readings of body temperature from an adult male kangaroo rat from 15 November 2000 to 22 April 2001. The implanted kangaroo rat spent 37% of its time in a hibernation state (torpor). Its minimum body temperature was 13°C and its final hibernation cycle concluded on 7 March 2001. Until now, the late winter (January to April) hibernation patterns of kangaroo rats were completely unknown.

A database was compiled describing the demography, distribution and activities of kangaroo rats during the year immediately prior to construction of the proposed North Suffield pipeline, which will transect the range of kangaroo rats in Alberta during 2001. These data will provide a valuable pre-disturbance baseline from which to evaluate kangaroo rats' potential responses to industrial activities in 2001.

Recommendations/Future Direction

The information collected in this study and previous work will act as invaluable reference material in the recovery planning process for this proposed endangered species. It will be used in tools such as computer models to evaluate what effects improvements to habitat will have on Ord's kangaroo rat populations and thus to enable decision making.

The results of this study also provide a baseline for a study of the effects of the North Suffield pipeline, to be installed in the area in 2001. This important case study will contribute to the development of guidelines for future industrial developments and recommendations for mitigation actions. The information obtained on hibernation of the Ord's kangaroo rat is also very important for the development of appropriate guidelines for industrial activities.

The data from this study will complement information collected in previous years to improve our understanding of the species' distribution at a fine scale. Work will be continued in 2001 on a broader scale to search for this species in other areas of suitable habitat in the province.

COOPERATING AGENCIES

Provincial Museum of Alberta, Canadian Forces Base Suffield, Canadian Wildlife Foundation, Natural Sciences and Engineering Research Council of Canada, University of Saskatchewan

For more information contact:

Terry Kosinski *(see page 5)* and see Species at Risk Report (in prep.), Population demography, distribution and seasonal activities of Ord's kangaroo rats.

SWIFT FOX NATAL DEN MONITORING

Project Supervisor: **Dale Eslinger**

REGION:
Provincial (conducted in Prairie)

TARGET SPECIES:
Swift Fox (*Vulpes velox*)

WILDLIFE ACT CATEGORY:
Endangered

PROVINCIAL GENERAL STATUS:
At Risk

purpose

To monitor the status of known swift fox natal den sites in the southeast corner of the province.

Background

Swift fox were extirpated in Alberta by the late 1930s; however, reintroduction efforts have resulted in the re-establishment of the species in the province. The swift fox is currently listed as *Endangered* in Alberta and is fully protected under the *Wildlife Act*.

Native to short- and mixed-grass prairie regions, the swift fox began to decline as native grasslands were converted to agricultural lands in the late 1800s. A variety of factors led to the extirpation of this species from Canada, including loss of habitat, interspecific competition (primarily from coyotes), vulnerability to trapping and poisoning programs, and severe climate conditions.

Captive breeding began in 1973 through a privately run program and between 1983 and 1996, 540 foxes were released in the Alberta/ Saskatchewan border and Milk River Ridge areas.

In order to update the status of this species, it is important to determine which of the 47 known natal den sites are still active. This will give some indication of the productivity of the swift fox. This activity will complement the Alberta/ Saskatchewan/Montana population survey that is scheduled for winter 2000-2001.

Methods

Each of the den locations was visited to document the presence or absence of foxes and determine litter size, if possible. Other incidental sightings were recorded. All data were entered into the Biodiversity/ Species Observation Database (BSOD).

Results

In total, 47 den site locations were examined twice during the period of July 7 - 26, 2000. Surveys were carried out during dawn to mid-morning and dusk periods. Detailed ground searches and intensive viewing of areas documented to have been used during 1995-1999 revealed no current use of the sites. No active dens were found in the immediate area (within a 100 m radius) of historical den sites.

Five swift foxes were observed during the course of the study, 4 of which (2 adults and 2 young-of-the-year pups) were found at an active den site within 0.4 km of 2 historical den site locations. The fifth fox was observed travelling across the prairie and then disappearing into a tunnel. Closer examination revealed that the tunnel was likely just a resting site, and no active natal den was found in the area.

Recommendations/Future Direction

In general, the 2000 study results suggest very limited use of areas that had been documented to support swift fox natal den sites in the past. Reasons for this reduced use are unknown, but may relate to changes in abundance and/or distribution of the swift fox.

It is recommended that an evaluation of the effectiveness of daytime-searching techniques be undertaken considering the nocturnal nature of this species.

swift fox

None

For more information contact:

Richard Quinlan *(see page 5)*.

2000-2001 INTERNATIONAL SWIFT FOX POPULATION CENSUS

Project Supervisor: **Steve Brechtel, Axel Moehrenschlager** (Calgary Zoo)

REGION:
Provincial (conducted in Prairie)

TARGET SPECIES:
Swift Fox (*Vulpes velox*)

***WILDLIFE ACT* CATEGORY:**
Endangered

PROVINCIAL GENERAL STATUS:
At Risk

purpose

To evaluate swift fox populations and trends in Alberta, Saskatchewan and Montana, identify suitable swift fox habitat, and use these data to re-direct management strategies.

Background

Swift fox were extirpated in Alberta by the late 1930s; however, reintroduction efforts have resulted in the re-establishment of the species in the province. The swift fox is currently listed as *Endangered* in Alberta and is fully projected under the *Wildlife Act*.

Native to short- and mixed-grass prairie regions, the swift fox began to decline as native grasslands were converted to agricultural lands in the late 1800s. A variety of factors led to the extirpation of this species from Canada, including loss of habitat, inter-specific competition (primarily from coyotes), vulnerability to trapping and poisoning programs, and severe climate conditions.

Captive breeding began in 1973 through a privately run program and between1983 and 1996, 540 foxes had been released in the Alberta/Saskatchewan border and Milk River Ridge areas.

The international swift fox census will be the focal point in evaluating the success of the recovery plan in achieving a self-sustaining population. The census is one component of a multi-faceted program aimed at assessing the health of swift fox habitat and populations in the Canadian prairies and Montana.

Methods

Prior to the census, habitat suitability maps of potential swift fox habitat in Alberta, Saskatchewan and Montana were generated and used to stratify census sample blocks. Areas of suitable habitat were identified using swift fox occurrence data obtained from the previous national census, in conjunction with detailed Geographic Information System (GIS) topography, land use and vegetation information for the census area.

Survey protocol and trapping locations replicated those used in the 1996-1997 census. In Montana, a sampling area was chosen based on previous survey results and preliminary habitat analyses.

Results

Between November 3, 2000 and February 24, 2001, one hundred and forty-nine swift fox were captured in 151 townships in Alberta, Saskatchewan and Montana. Six traps were set in each township for 3 nights (18 trapping nights per township) in most cases.

Swift fox observations in Alberta, Saskatchewan and Montana

Region	Number of townships surveyed	Number of swift fox captured	Number of trap nights	Capture rate (fox/ trap night)	Percent of swift fox recaptured
Alberta/Saskatchewan border	55	97	969	0.1001	33
Grasslands National Park (Saskatchewan)	30	14	540	0.0259	29
Montana	66	38	1188	0.0320	32

Preliminary habitat analyses using GIS suggest that there might be a trend towards more foxes being caught in areas with lower mean slope classes.

A final report is being prepared and will include an analysis and interpretation of census results.

Recommendations/Future Direction

In 2001-2002 the Canadian swift fox recovery team will assess the future direction of the recovery program by interpreting census results, collaborating with Montana agencies, and addressing habitat protection needs in Canada and the United States. Results will be communicated through reports, scientific publications, local and national media, and Calgary Zoo education programs.

Calgary Zoo, Alberta Conservation Association, Alberta Sport, Recreation, Parks and Wildlife Foundation, Wildlife Preservation Trust Canada, Montana Department of Fish, Wildlife and Parks, Saskatchewan Environment and Resource Management, Canadian Wildlife Service, Grasslands National Park.

For more information contact:

Steve Brechtel or **Sue Cotterill**
(see page 5) and see Species at Risk Report (in prep.), International swift fox census 2000-2001: demographic changes of reintroduced swift foxes in Canada and Northern Montana.

WOLVERINE INVENTORY ANALYSIS AND WORK PLAN

Project Supervisor: **Lisa Wilkinson, Matt Besko**

REGION:
Provincial (conducted in Northeast Boreal, Northern East Slopes)

TARGET SPECIES:
Wolverine (*Gulo gulo*)

WILDLIFE ACT CATEGORY:
Fur-bearing Animal
(ESCC Recommendation: Data Deficient)

PROVINCIAL GENERAL STATUS:
May Be At Risk

COOPERATING AGENCIES:
None

purpose

To develop an objective method of estimating population distribution, trend and abundance of wolverine.

Background

Limited information exists about the distribution and status of wolverine in Alberta. The information that does exist has primarily been derived from trapping data. To date, no studies examining distribution and abundance have been conducted.

The provincial population of wolverines is considered small—potentially less than 1000 individuals—and presently the species' range is being reduced by human encroachment. Wolverines were once found throughout Alberta but now only occur in the northern half of the province and along the mountains and foothills.

Recent and continued expansion of industrial activity (e.g., forestry and oil/gas exploration and extraction) and agriculture has led to widespread habitat loss, habitat alteration and disturbance for sensitive species of furbearing mammals. Concern from trappers and the scientific community suggests that both the distribution and abundance of wolverine (and perhaps fisher and lynx) may be declining in the province. Given these conservation concerns, an objective method of estimating population distribution, trend and perhaps abundance would greatly aid conservation efforts. Recently developed hair sampling and genetic analysis techniques may offer a feasible means of monitoring wolverine abundance in forested environments, though testing is needed to develop a standardized methodology.

Methods

All existing data on wolverine populations, including trapper information, were reviewed and analyzed, and a literature review was conducted. Wolverine inventory methods were reviewed, highlighting the advantages and disadvantages of each method. Emphasis was placed on a DNA inventory, including study design considerations for an Alberta study. Prototype traps were tested in conjunction with an AlPac/University of Alberta study to test the efficacy of the traps for hair capture. Special consideration was given to methods that may also sample fisher and lynx at the same time.

Results

Several trap types were tested for wolverine this winter in Alberta. A total of 46 hair samples were collected from 27 traps: 15 traps in the Northern East Slopes Region (mostly in the Hinton and Grande Cache area), and 12 in the Northeast Boreal Region (half in the Athabasca area and half in the Lac La Biche area). The hairs from the traps are currently being sorted and analyzed for species, and results should be ready late spring 2001.

Recommendations/Future Direction

The results of the hair capture trial will dictate whether further testing of inventory techniques is required. If the trial has been successful (wolverine hair captures at multiple sites), a census will be initiated, likely in the northwest corner of the Northwest Boreal Region, to determine wolverine abundance using DNA techniques.

wolverine

For more information contact:

Lisa Wilkinson *(see page 5)* and see Mowat, G. 2001. A review of methods measuring wolverine distribution and abundance. (Interim report for Fish and Wildlife Division)

CARIBOU HABITAT MAPPING FOR THE NORTHEAST BOREAL REGION

Project Supervisor: **John Martin**

REGION:
Northeast Boreal

TARGET SPECIES:
Woodland Caribou (*Rangifer tarandus caribou*)

WILDLIFE ACT **CATEGORY:**
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

purpose To quantify and analyze woodland caribou habitat in order to establish suitability thresholds and develop protection strategies.

Background

Woodland caribou distribution in Alberta is discontinuous in the northern forests. Long term population trends are unknown, although some populations have decreased.

Human activity increases caribou's vulnerability to predation, which is a major limiting factor. This species has a fairly low reproductive rate, which may reduce the speed of recovery from even a small population decline.

The woodland caribou relies on large tracts of mature and old forest as well as peat-dominated wetlands and sedge meadows. Forest fragmentation by linear corridors, forestry, mining and agricultural expansion negatively affects woodland caribou populations in Alberta.

The Northeast Boreal Region is undergoing rapid industrial development. Geophysical exploration, oil and gas extraction, peat harvesting, logging and oilsands mining are all expanding quickly. There is an urgent need to quantify and analyze woodland caribou habitat in order to establish thresholds of suitability and develop protection strategies. Unfortunately, the existing Key Caribou maps (now 15 years old) are too inaccurate and imprecise to support these tasks. The Northeast Boreal Region initiated a project in 1999-2000 to incorporate caribou radio-telemetry data into the process to define and map caribou habitat.

Methods

Unclassified satellite imagery was compared with caribou locations by overlaying these two data sources in a Geographic Information System. Unclassified satellite imagery was then used to extrapolate caribou habitat preferences to the remaining northeast region, where there was little or no caribou information.

Results

Using results for the Wabasca region, the spectral classes were used to create an image of the area directly north as well. Results were processed using a supervised classification. The 2 images were merged to produce a final map.

Our results indicated that Alberta Vegetation Inventory (AVI) data are not adequate to accomplish the objectives of this project, so we decided to explore the role that Alberta Ground Cover Classification (AGCC) can play on class description. We found that AGCC provides more aggregated information to allow for accurate labelling of caribou preferred classes. There is a close correlation between initial labels and the AGCC classes. We conclude that AGCC provides an adequate level of aggregation for labelling preferred classes extracted from the multi-spectral analysis.

Corroboration with very high frequency (VHF) located caribou sites indicates that a correlation between caribou habitat and VHF location is high ($r^2 = 0.92$).

Our results indicate that the current spatial distribution of points, and especially the limited number of observations, does not provide the necessary level of information to define caribou habitats based on spectral reflectance classes for the Cold Lake Air Weapons Range (CLAWR).

Results from the Wabasca and CLAWR were extrapolated to the remaining areas using a supervised classification approach. Images were merged and a full coverage for the Northeast Boreal Region has been created.

Recommendations/Future Direction

Maps with minimum mapping units (MMU) less than 8 ha did not provide the landscape stability necessary to ensure consistency in mapping results. A MMU of 10 ha is recommended based on our landscape structure analysis.

The AGCC-developed data sets are robust for the identification of preferred caribou habitats.

Problems are still present in the identification of individual classes that may be of importance for caribou habitat. Specifically, there is a need to further develop the identification of classes such as Open-Shrubs, which seems to be too small to be identified by Landsat ™.

We recommend that a further study for a selected area must be developed using IKONOS hyperspectral data. Because of the high spatial resolution of IKONOS, several of the questions regarding the preference or avoidance of specific classes such as Open-Fens can be further evaluated.

Further analysis must be performed using other remote sensing platforms. We recommend extrapolating the study to use MODIS level 1B data with a spatial resolution of 250 and 500 meters. Data developed in this study linked to MODIS (hyperspectral data) will help to enhance the available data sets as well as to allow for full integration of the Wabasca and CLAWR information.

COOPERATING AGENCIES

Boreal Caribou Research Subcommittee

For more information contact:

Matt Besko *(see page 5)*.

WEST-CENTRAL ALBERTA CARIBOU STANDING COMMITTEE RESEARCH PROGRAM

Project Supervisor: **Kirby Smith, Dave Hervieux**

REGION:
Northern East Slopes, Northwest Boreal

TARGET SPECIES:
Woodland Caribou (*Rangifer tarandus caribou*)

WILDLIFE ACT CATEGORY:
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

purpose

To assist and support the second year of the West-Central Alberta Caribou Standing Committee (WCACSC) Research Program.

Background

Woodland caribou distribution in Alberta is discontinuous in the northern forests, with approximately 100 individuals in the foothills east of Willmore. Long-term population trends are unknown; however, population studies suggest that most populations are stable, although some local populations appear to have decreased.

Human activity increases caribou's vulnerability to predation, which is a major limiting factor. The caribou's main predator, wolves, may respond positively to industrial activity, which could negatively affect caribou populations through increased predation. Given this possibility, further research on wolves is needed to learn how they use a landscape modified by humans.

The caribou's reliance on large tracts of mature and old forest with a high abundance of lichens is its primary limiting factor. Forest fragmentation by linear corridors, forestry, mining and agricultural expansion negatively affects woodland caribou populations in Alberta.

Knowledge of the effects of habitat fragmentation on woodland caribou habitat supply will enable responsible planning of resource extraction in caribou zones.

Methods

First, research was conducted on wolves to investigate linkages between industrial land use and the distribution of wolves and their kill sites. This research will provide crucial information for industrial land use planning by determining the type and intensity of human use that may contribute to unsustainable predation rates. The second research area involved analyses of habitat requirements. This information is critical for maintaining sufficient supplies of caribou habitat over time.

Caribou habitat research was carried out in the Redrock/Prairie Creek winter range. Data on habitat requirements for foraging were collected by snowtracking. Radio-collared caribou were located from the air to provide starting points for tracking sessions. Tracks were followed and habitat information was recorded at cratering sites (areas where caribou were digging for forage beneath the snow), arboreal lichen feeding sites, and at sites where caribou were not feeding (i.e., controls). Habitat information included snow conditions, forest cover, understory cover, arboreal lichen growth and topography.

Components of both the wolf and caribou habitat studies will be presented at conferences, published in scientific journals and compiled in graduate dissertations. A process is also underway to have all caribou data collected by the WCACSC integrated into the Alberta government's new Fish and Wildlife Management Information System (FWMIS) database.

Results

This year, another 10 Global Positioning System (GPS) collars and 5 very high frequency (VHF) collars were placed on wolves in the Redrock and Little Smoky caribou ranges. This raises the total number of wolves that have been collared to 30. There are collars on members of 8 different wolf packs.

The data collected on wolves will be compiled and analyzed primarily by graduate researchers at the University of Alberta. Natural history information, such as pack size and territories, as well as how wolves use landscapes modified by human activity will be documented. To examine caribou habitat selection, more than 35 tracking sessions (averaging 2 km per session) were conducted during a 2.5 month period.

Recommendations/Future Direction

Research on wolves in west central Alberta will provide detailed information on how wolves use a landscape modified by humans. Since wolves are the major predator of caribou, knowledge about the effects of roads, cutblocks, seismic lines and pipelines is instrumental for planning for the needs of caribou. To ensure the long-term persistence of caribou, human development must be kept to a level that does not create unsustainable predation rates. So far, researchers have discovered that wolf packs are fairly large, averaging 8 members per pack with a maximum of 18 members.

The caribou habitat selection study will provide information about what caribou need under a range of environmental conditions. This information will assist managers in planning for the suite of habitats required. Managers must maintain sufficient habitat such that caribou can spread out in their preferred habitat and avoid predators such as wolves. Living at low densities is an anti-predator tactic critical to the persistence of caribou populations. This habitat information is urgently needed for the recovery process, since planning for long-term habitat supply will likely be a major management tool.

COOPERATING AGENCIES

West-Central Alberta Caribou Standing Committee, University of Alberta, Weyerhaeuser Canada, Weldwood of Canada, Canfor, Alberta Newsprint, a number of energy companies, Alberta Conservation Association

For more information contact:

Adam James *(see page 5)* and see Species at Risk Report No. 23, 2000-2001 progress report on caribou research in west central Alberta.

WOODLAND CARIBOU SURVEYS

Project Supervisor: **Bob Wynes** (BCRP), **Christine Found, Dave Moyles, Mark Heckbert, Floyd Kunnas**

REGION:
Provincial (conducted in Northwest Boreal, Northeast Boreal)

TARGET SPECIES:
Woodland Caribou (*Rangifer tarandus caribou*)

***WILDLIFE ACT* CATEGORY:**
Threatened

PROVINCIAL GENERAL STATUS:
At Risk

purpose To continue annual surveys of woodland caribou populations as our major contribution to caribou monitoring and research efforts.

Background

Woodland caribou are *Threatened* in Alberta. Long-term population trends are unknown; however, recent population studies suggest that most populations are declining.

Several woodland caribou populations are being studied as part of the Boreal and West Central Caribou Research Programs. Through this initiative, large numbers of female caribou have been radio-collared to collect information on recruitment, survival and mortality. These data are the only available means we have to track population trends and compare areas with varying degrees of industrial activity. Some of these caribou populations are experiencing considerable amounts of disturbance due to industrial activities. Without these surveys, we would have no method of determining herd health.

Methods

Aerial surveys were completed to determine calf recruitment in all major caribou ranges currently under study. This information is used with data on adult survival to determine the rate of population change. The locations of all caribou seen were entered into the Biodiversity/Species Observation Database (BSOD).

Results

The Boreal Caribou Research Program (BCRP) is monitoring five different ranges in northern Alberta: a group of ranges on the west side of the Athabasca River (WSAR), a group of ranges on the east side of the Athabasca River (ESAR), the Caribou Mountains, Red Earth, and the Cold Lake Air Weapons Range (CLAWR), plus the Saskatchewan side of the Cold Lake Air Weapons Range. Results of the 2001 calf recruitment surveys, with a comparison to previous surveys, are presented in Table 1. In March, calves are only about 10 months of age, so the values presented represent an optimistic view of recruitment. The average values presented in the table represent the average calf recruitment observed in that range since the inception of the study in that range.

Table 1 - Calf recruitment in BCRP study areas (*calves per 100 cows*)

	1994	1995	1996	1997	1998	1999	2000	AVE	2001
WSAR	28	22	20	29	36	26	18	26	17.0
ESAR	10	22	20	15	-*	37	28	22	11.0
Red Earth	-	9	25	18	46	15	12	21	15.5
Caribou Mt.	-	11	16	24	10	12	7	13	5.9
CLAWR AB	-	-	-	-	-	19	14	17	6.4
CLAWR SK	-	-	-	-	-	32	19	26	13.4

*March calf survey not done in 1998 due to budgetary constraints.

1994 – 2000 data from *The Status of Woodland Caribou in Alberta* (Dzus 2001)

As can be seen in Table 1, calf recruitment is substantially lower in 2001 in all of the ranges being monitored when compared to the average value for the range for previous years. May calf production has been consistently high, based on monitoring of radio-collared females. Low calf recruitment, therefore, appears to be related to high calf mortality rather than low production. Causes of calf mortality have not been researched in these ranges, but it is suspected that predation by wolves and/or black bears within the first several weeks of life may be a factor. Based on research of the BCRP, it appears that linear corridors such as seismic lines, pipelines and roads may be increasing wolf hunting efficiency, and managers are concerned that this may be contributing to low calf recruitment.

Previous years' calf recruitment data, combined with adult survival rates, have been used to develop population trend graphs for the various ranges. These graphs are presented in *The Status of Woodland Caribou in Alberta* (Dzus 2001). As the adult survival rate is based on a May 1 to April 30 time period, population trend graphs will be updated after May 1, 2001.

Table 2 presents the total numbers of caribou observed per range in the March 2001 calf recruitment survey, as well as the breakdowns by age and sex. Age can only be reliably discriminated between calves (approximately 10 months old) and adults. Occasionally, due to restricted visibility in certain habitats, the age or sex of some animals can not be determined.

Table 2 - Breakdown of bulls, cows and calves observed in 2001 calf recruitment survey

	Cows	Bulls	Unknown Sex	Calves	Unknown Age & Sex	Total	Collars Monitored*
WSAR	107	45	7	18	0	177	34
ESAR	86	15	0	9	0	110	28
Red Earth	84	32	2	13	0	131	25
Caribou Mt.	170	22	0	10	0	202	24
CLAWR AB	110	23	9	7	9	158	23
CLAWR SK	82	18	0	11	0	111	22

* all radio collars are deployed on adult female caribou except 5 bulls in Red Earth and 1 bull in WSAR

During March, adult bulls and cows tend to be spatially segregated. As the majority of our radio transmitters have been deployed on cows, the bull composition in the herds is under-represented.

The total numbers of animals observed in each range provides an indication of the minimum population present in the range at that time.

However, because we do not know what proportion of the population we have radio collared, or what proportion of the population we are observing, these values can not be extrapolated to a total population estimate.

Recommendations/Future Direction

Woodland caribou in Alberta have been a major issue for wildlife managers and industrial operators within caribou range for at least the last 20 years. A tremendous amount of time and resources have been invested into trying to understand issues created by industrial operations within caribou range. In the short and long term, population trends are the only definitive tool we have available to judge the success of mitigation efforts that are undertaken relative to industrial or other issues. To date, declining caribou populations in many of the Alberta ranges indicate that we have not resolved the issues faced by caribou. It is critical that we continue to monitor population trends, of which calf recruitment surveys are a major component, on an annual basis. This monitoring should continue until wildlife managers are satisfied that management issues have been resolved and that caribou populations and habitat suitability and supply will be maintained.

COOPERATING AGENCIES

Boreal Caribou Research Program, Alberta Conservation Association, University of Alberta, Natural Sciences and Engineering Research Council, many industries

For more information contact:

Tara Szkorupa *(see page 5)*.

ALBERTA BAT MONITORING: PILOT AND PROTOCOL DEVELOPMENT

Project Supervisor: **Margo Pybus, Robin Gutsell**

REGION:
Provincial (conducted in Northwest Boreal, Northeast Boreal)

TARGET SPECIES:
Bat species occurring in Alberta, particularly those listed as *May Be At Risk* or *Undetermined*.

***WILDLIFE ACT* CATEGORY:**
Non-licence Animals

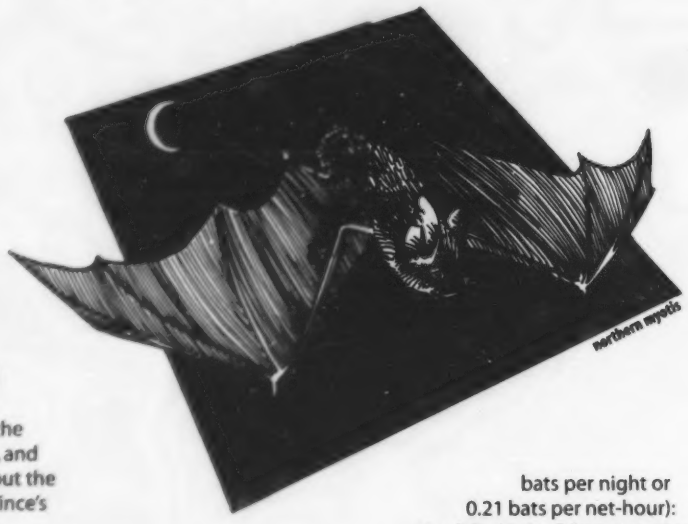
PROVINCIAL GENERAL STATUS:
May Be At Risk: Northern Myotis
Secure: all others captured

purpose

To increase our knowledge of bat distribution in all parts of the province, with a focus on central and northwestern Alberta, and to develop a bat monitoring protocol.

Background

The status of bats in general is not well known, and monitoring of bat populations is necessary to determine the status of some species in Alberta. Increasing our knowledge of this little-known group of species will allow us to understand and monitor the effects of industrial development in the northern forests of Alberta, and to make wise decisions about the sustainable use of the province's resources.



Previous bat studies conducted in Alberta have been limited in geographical scope, and no long-term, province-wide, standardized monitoring program has ever been conducted. Standardized bat surveys will provide needed information on bat species diversity in northern forest management areas, and assist in developing general biodiversity monitoring programs.

Methods

A draft protocol for conducting bat surveys in Alberta was developed and tested in the field by conducting surveys using bat detectors and mist nets. The draft protocol was assessed, revised and distributed to researchers in the province for further testing and review. Members of the public were informed about bat biology and habitat and the particulars of this project through brief or in-depth discussions with the field crew.

Data detailing geo-referenced locations of bat species in Alberta were entered into the Biodiversity/Species Observation Database (BSOD).

Results

Mistnetting took place on 36 nights for a total of 141 hours, or a total of 494.6 net-hours. A total of 86 adult and 19 juvenile bats were captured (2.9 bats per night or 0.21 bats per net-hour): 43 adults in the Edmonton area, and 43 adults and 19 juveniles in northwestern Alberta. Four species of bats were captured during surveys in central and northwestern Alberta: big brown (*Eptesicus fuscus*), silver-haired (*Lasionycteris noctivagans*), little brown (*Myotis lucifugus*) and northern myotis (*M. septentrionalis*) bats. Little brown bats accounted for the greatest proportion of adult captures, with 73% ($N = 63$) of captures, followed by northern myotis, big brown and silver-haired bats.

No bats were captured in the Caribou River study area. Of the remaining study areas, adult male and female little brown bats were captured in all but the Rainbow Lake area, while northern long-eared bats were captured in all areas with the exception of Lesser Slave Lake. Two male and 1 female big brown bat were captured at Sousa Creek, while a single female was captured at Wabasca River. Adult silver-haired bats were only captured in the Edmonton Area, with 2 females captured at a single study site (Moss Lake) in Elk Island National Park.

At every study area where females were captured, at least some of those females were reproductive. The only non-parous adult females captured during the survey were a single northern myotis bat captured at Sousa Creek and 10 little brown bats captured at Wabasca River ($n = 4$), Lesser Slave Lake ($n = 2$) and the Edmonton area ($n = 4$). Juvenile bats of 3

species (little brown, northern myotis and silver-haired) were captured in the Wabasca River and Lesser Slave Lake areas. The only study area where no reproductive females or juveniles of any species were captured was Rainbow Lake.

Recommendations/Future Direction

The results of the first year of surveys are encouraging: significant range extensions were observed for three of the four bat species, and reproductive populations were encountered in all but one study area. Furthermore, the newly developed protocols withstood their first field test. Future surveys in the province are likely to yield similarly exciting and useful results.

Recommendations for future work on bats in Alberta include:

1) Continue sampling in central and northwestern Alberta, including a broader coverage of natural subregions not included in this survey.
2) Expand surveys to other regions of the province, with a priority placed on northeastern Alberta, because of the high levels of industrial development in this region.
3) Develop a database within the Fish and Wildlife Management Information System to store all data collected on bats in the province including banding information. This will facilitate identification of information gaps and survey priorities.
4) Make surveys for hibernacula in Alberta a strong priority as few hibernacula have ever been found in the province.
5) Determine the pathways and stopover points used by the two species of migratory bats (hoary and silver-haired) in Alberta.
6) Study the roosting habitat requirements, including temporary diurnal roosts, of forest-dwelling and building-dwelling bats in Alberta.
7) Ensure that all studies in Alberta collect ectoparasites from captured bats. Ectoparasites are a conspicuous feature of bats everywhere, and are an important component of biodiversity in Alberta along with their bat hosts.

Alberta Sport, Recreation, Parks and Wildlife Foundation, Alberta Conservation Association

For more information contact:

Lisa Wilkinson *(see page 5)* and see Species at Risk Report No. 4, Survey of the bats of central and northwestern Alberta.

ANALYSIS OF HISTORICAL TRAPPING RECORDS OF FURBEARERS IN ALBERTA

Project Supervisor: **Lisa Wilkinson, Matt Besko**

REGION:
Provincial (conducted by Northern East Slopes, Northeast Boreal)

TARGET SPECIES:
All furbearers listed in the trapping records

WILDLIFE ACT CATEGORY:
Fur-bearing Animals

PROVINCIAL GENERAL STATUS:
Varied

purpose

To synthesize and analyze historical trapping records on a provincial scale to identify potential trends in furbearer distribution and abundance over time.

Background

Limited information exists for determining population trends for furbearers in Alberta, and additional information is required to assess furbearer distribution and relative abundance. Analyses of historical trapping records and fur affidavits may provide some of this information and identify data gaps for future inventory projects. Trends in distribution and relative abundance may also identify species that require a more conservative management approach, and may assist in refining current status.

Methods

A detailed protocol was prepared regarding the use of historical trapping records to assess furbearer population trends, abundance and distribution, by species. The protocol included objectives, logistical considerations and an analysis of the feasibility of the suggested method for all regions of Alberta.

Results

Three partially overlapping sources of Alberta furbearer data were obtained: trapper affidavits and fur dealer records (from 1977-1978 to 1998-1999), export permits (from 1977-1978 to 1998-1999), and compulsory registration for wolverine, fisher, lynx and otter (1988-1989 to 1999-2000). A review of furbearer harvest data collection sources was conducted, outlining their associated advantages and disadvantages. A literature review was conducted on the factors affecting harvest returns. The statistical analyses involving population trends, distribution and density/abundance will be included in the final report.

Recommendations/Future Direction

A host of factors can influence trapper effort and success, and hence harvest returns. These factors include changes in target species population numbers, season length, quota changes, trap type restrictions, fur prices, weather, socio-economic conditions, subsidies, mode of transportation and ease of access (e.g., along seismic lines in northern Alberta). Each factor can influence harvest returns independently, or in conjunction with other factors. Catch per unit effort (CUE), also known as harvest per unit of trapping effort (HUE), can be used as an indirect indicator of population trend, given a number of assumptions.

Harvest data are generally poor short-term indicators of animal abundance because of the dynamic character of the trapping system. The literature suggests that it is not possible to infer trends in species abundance from harvest levels alone, given the number of factors that can influence trapper effort and success, and hence harvest returns. To our knowledge, trapper effort data have not been collected in Alberta. At present, we suggest that the strongest use of the historical harvest data is for analysis of species distribution.

Data on species' distributions would have the greatest accuracy, and error in the data set would be minimized. Use of data verification routines, collection of an index or measure of harvest effort, and a detailed examination of the differences and biases between fur harvest collection methods currently used would increase the usefulness of the fur harvest data collected. Additional recommendations will be provided in the final report.

COOPERATING AGENCIES

Alberta-Pacific Forest Industries, University of Alberta

For more information contact:

Matt Besko *(see page 5)* and see Species at Risk Report (in prep.), Alberta furbearer harvest data analysis.

COLLECTION AND ANALYSIS OF OWL PELLETS TO IMPROVE KNOWLEDGE OF DISTRIBUTION AND RELATIVE ABUNDANCE OF PRAIRIE SMALL MAMMALS

Project Supervisor: **Gordon Court**

REGION:
Provincial (conducted in Prairie, Bow, Parkland)

TARGET SPECIES:
Small Mammals

WILDLIFE ACT CATEGORY:
Varied: Non-game and Non-licence Animals

PROVINCIAL GENERAL STATUS:
Varied

COOPERATORS

None

purpose

To establish the distribution and relative abundance of many species of small mammals in Alberta, and expand the area of research to the western grasslands of Alberta.

Background

The main prey of great horned owls is small mammals. Through analysis of owl pellets (regurgitated non-digestible prey remains), it is possible to establish ranges and relative abundance of many species of small mammals in Alberta. This project builds on previous research, and focuses on the western grasslands of Alberta.

Owl pellet analysis has proven a cost- and time-effective method of gathering data on small mammals. Every large sample of pellets examined from the province has produced at least one new small mammal distribution record and valuable information on the relative abundance of species of management concern.

This project gathers information about poorly known species and provides population data for longer-term management plans for species of concern. Information will also be provided on species-specific habitat associations.

Methods

Old buildings, nest sites and other owl roosts in the area of sampling interest were investigated. Pellets were collected, geo-referenced, dried and stored. Following the collection phase, pellets were picked apart and mammalian prey remains were identified. Data were entered into the Biodiversity/Species Observation Database (BSOD).

Results

New distribution or significant marginal records were obtained for prairie shrew, water shrew, Nuttall's cottontail, northern pocket gopher, olive-backed pocket mouse, northern grasshopper mouse, long-tailed vole, prairie vole and sagebrush vole. As well, specimens of deer mouse with unusual dental characteristics were recovered from west of the Porcupine Hills.

The absence of northern grasshopper mouse from several sites at comparatively high elevation suggests that the general limit of distribution of the species may be within the area examined. Similarly, sagebrush voles were absent from a sample within suitable habitat north of Calgary, which suggests that the limit of that species' distribution was also encountered. Considerable further work is needed to confirm these observations.

Sagebrush voles had previously been given the general status of *Status Undetermined* in 1996. Based on the results from owl pellet studies, which have shown the species to be relatively abundant and distributed over much of the southern part of Alberta, this species has been reclassified as *Secure*. Similarly, the northern grasshopper mouse was reclassified from *Yellow B* (naturally rare) to *Secure* as a result of their relatively high rate of occurrence in owl pellets.

The study also provided new data on the distribution and abundance of olive-backed pocket mouse and prairie vole, 2 species that have been identified as being of conservation concern.

Recommendations/Future Direction

Examination of owl pellets is demonstrably effective in expanding information about the distribution and abundance of many small mammal species, several of which are of conservation concern. This limited study produced a large amount of significant new data. Examination of pellets from an expanded geographic area and additional habitat types is very likely to be highly productive. A systematic program to carry out such a study should be initiated.

For more information contact:

Gordon Court *(see page 5)* and see Species at Risk Report No. 17, Distribution and relative abundance of small mammals of the western plains of Alberta as determined from great horned owl pellets.

plants

WESTERN BLUE FLAG RECOVERY PROGRAM

Project Supervisor: **Richard Quinlan**

REGION:
Provincial (conducted in Prairie)

TARGET SPECIES:
Western Blue Flag (*Iris missouriensis*)

WILDLIFE ACT CATEGORY:
None

(ESCC Recommendation: Threatened)

PROVINCIAL GENERAL STATUS:
May Be At Risk

purpose To develop a management and recovery plan for the western blue flag in Alberta.

Background

The western blue flag is distributed primarily in the western United States but just extends into Canada along the southeastern edge of the Rocky Mountains in Alberta. It is considered rare in Canada and Alberta.

In Alberta, this species occurs only in the extreme southwestern corner of the province, in wet meadows and shorelines. It is restricted to the Foothills Fescue Grassland and Foothills Parkland Natural Subregions – areas that have undergone extensive modification from their natural state by human activity.

The current population of this species in Alberta is estimated at less than 7500 stems. The most significant threats to the western blue flag include heavy grazing pressure, habitat alteration including flooding, and competition from non-native species.

The maintenance of this species in Alberta is of high ecological importance. As one of the first plant species to be considered for legislative designation in Alberta, it is important also in setting a prototype for the management plans of other plant species.

The objectives of this project were to locate and inventory all known populations of naturally occurring western blue flag in Alberta, assess habitat conditions and identify threats at each site, and request landowner support for long-term conservation plans.

Methods

A literature/database review was conducted to identify distribution and status. Previous studies and reports were reviewed to determine locations and other information related to known populations. Landowners were contacted for each extant site listed, and permission to enter their property was obtained. A field inventory of all sites was carried out.

Results

Gould (1999) shows 6 extant populations of naturally occurring western blue flag in Alberta. As a result of investigations carried out in 2000, it is believed that there are only 4 remaining. At all sites inventoried, stem counts were higher in 2000 than they were in 1998, except at Police Outpost Provincial Park (POPP) west.

A comparison of stem count and flowering stalks for the years 1989, 1998, and 2000

Site	Date	Total Stems	Flowering Stalks
POPP west	1989	650	6
	1998	325	1
	2000	219	14
POPP east	1989	n/a	n/a
	1998	n/a	n/a
	2000	175	14
Landowner Site 1	1989	1500	several hundred
	1998	n/a	n/a
	2000	2091	304 (mostly pods)
Landowner Site 2	1986	5000	high proportion
	1998	n/a	n/a
	2000	6049	256
Landowner Site 3	1989	203	0
	1998	111	2
	2000	171	2

n/a = information not available or site not inventoried that year

Recommendations/Future Direction

The project included the following specfic recommendations:

1) No developments that would have a negative impact on western blue flag.
2) No cultivation or alteration of hydrological processes that would have an impact on western blue flag.
3) A light to moderate grazing regime or seasonal grazing rotations designed to

benefit western blue flag. More research is needed to determine the optimal level of grazing or best season of use, but light to moderate grazing, not exceeding 40% removal of the current season's production, may be appropriate.

4) No use of chemicals or other control practices that would harm western blue flag.

5) Any haying activity is designed for minimum impact on western blue flag.

There are also some general recommendations for the continuation of the project:

1) Search for additional populations of western blue flag.

2) Distribute the colour brochure (1998) in the Carway area and request that landowners report any western blue flag plants found on their property.

3) Landowners at certain sites should be encouraged to continue managing as they have in the past. An investigation should be undertaken to determine the optimal level of grazing that would best encourage the growth and reproduction of western blue flag. Monitoring should be continued to ensure that the level of grazing applied is appropriate.

4) Communicate with landowners to encourage management practices that benefit western blue flag populations.

5) Design a simple program to monitor specific (and permanently marked) clumps of western blue flag to determine changes in density, flowering success and clump size.

6) Perform a periodic census of extant western blue flag populations. Frequency could be based on changes observed through monitoring the clumps.

COOPERATING AGENCIES

Alberta Native Plant Council, private landowners

For more information contact:

Richard Quinlan *(see page 5)* and see Species at Risk Report No. 18, Western blue flag *(Iris missouriensis)* in Alberta: a census of naturally occurring populations for 2000.

western blue flag

RARE PLANT LITERATURE REVIEW AND SURVEY PLAN

Project Supervisor: **Lisa Wilkinson**

REGION:
Northern East Slopes

TARGET SPECIES:
Rare Plants

WILDLIFE ACT CATEGORY:
None

PROVINCIAL GENERAL STATUS:
Varied

purpose | To establish priorities for rare plant surveys in the Northern East Slopes Region.

Background

To ensure that rare plants and their habitat are protected and conserved, it is necessary to provide an inventory of rare plant locations for consideration in land use planning. By describing the likely habitat for rare plants, field reconnaissance for land use proposals can become more effective.

Methods

Alberta Natural Heritage Information Centre (ANHIC) staff were contacted to obtain information on literature and any tracking lists that were available for rare plants in the Lower Foothills Subregion. The White Area (settled area) within the Northern East Slopes Region was of high priority for identifying rare plants due to a longer history of multiple land use activities (logging, oil and gas, grazing and urban development).

Results

Lists of the rare vascular and nonvascular plants that have been identified within or near the study area were compiled, including the assigned ranks of these species, based on the most up-to-date information in ANHIC (2000). Seventeen rare vascular plant species and 29 non-vascular species (22 bryophyte species and 7 lichen species) have been recorded in or near the study area (ANHIC occurrence records). These species should be considered target species for a rare plant survey. Additional species with the potential to occur in the study area, based on known distribution in west-central Alberta or on discussions in other published documents, are also identified for inclusion in future surveys.

A detailed sampling protocol for a rare plant inventory was developed using the Alberta Native Plant Council guidelines.

Recommendations/Future Direction

The survey protocol that was developed will be used in the summer of 2001 to initiate a rare plant survey in the White Area, east of Edson. The inventory will focus on rare plants identified by ANHIC and other sources as being likely to occur in the study area. It is expected that a review of ANHIC's ranks will occur prior to the 2001 field season, and a review and update of the target species lists will therefore be necessary.

The relative abundance of any species varies annually, and in some unfavourable seasons some rare species may not be visible. Because of this, rare plant surveys should optimally be conducted over more than one flowering season. All rare plant occurrences should be reported to ANHIC for inclusion in their database.

COOPERATING AGENCIES

Alberta Natural Heritage Information Centre

For more information contact:

Lisa Wilkinson *(see page 5)* and see Cornish, B. 2001. Proposed protocol for a rare plant survey in the lower foothills, Northern East Slopes Region, 2001. (Interim report for Fish and Wildlife Division)

PROPOSED PROTOCOLS FOR INVENTORY OF RARE PRAIRIE PLANTS

Project Supervisor: **Richard Quinlan**

REGION:
Prairie

TARGET SPECIES:
Various species

WILDLIFE ACT CATEGORY:
None

(ESCC Recommendation - Threatened: Western Blue Flag)

PROVINCIAL GENERAL STATUS:
Varied

purpose

To compile existing information on the distribution of rare plant species in the Prairie Region, and to develop a field inventory protocol for 2001-2005.

Background

There has been little work done on rare plants in Alberta. In order to collect the information necessary to determine the detailed status of selected *May Be At Risk* and status *Undetermined* plants in the Grassland Natural Region, it is necessary to develop a strategy for inventory and monitoring of these species.

This project allows researchers to determine inventory priorities for plant species of conservation concern in the Grassland Natural Region.

Methods

Existing information on rare plants was compiled and a five-year inventory and monitoring program was developed.

Results

Information was retrieved from the provincial Alberta Natural Heritage Information Centre (ANHIC) and a short habitat descriptor was added that divided the habitats into major landscape types. Additional information on the biogeographic distribution of the great plains species within the great plains region was also added and detailed element occurrence reports for all species were compiled.

Following ranking and the simplification of habitat information into 13 broad categories, the database was manipulated to determine the highest priority habitats, natural subregions and species within the Grassland Natural Region. These were further analyzed to determine logistical arrangements for conducting field surveys and preparation of status reports. A work plan was created which allocates research efforts over five years (2001-2005). There were 112 vascular plant species from within the Grassland Natural Region selected for detailed analysis and preparation of protocols over the 5-year period, based primarily on their provincial and global rarity and the level of threats to their population and habitat.

Recommendations/Future Direction

Thirty-two species were identified as priority species for detailed status assessment in 2001, and three species were selected for monitoring. Prior to proceeding with obtaining status reports on priority species there are considerations which will affect the scheduling, manpower and resource needs for status reports, particularly with respect to fieldwork aspects. These considerations include the amount of fieldwork effort required, ease of recognition of the taxa, proximity to other priority taxa and the potential for recovery planning.

COOPERATING AGENCIES

None

western spiderwort

For more information contact:

Richard Quinlan *(see page 5)* and see Species at Risk Report No. 21, Proposed protocols for inventories of rare plants of the Grassland Natural Region.

communication/resource tools

CANADA'S *SPECIES AT RISK ACT*: BUILDING CONSENSUS FOR CONSERVATION AND DEVELOPMENT

Project Supervisor: **Dale Eslinger**

purpose To design a consensus building process that will meet the needs of private landowners and government agencies in the Alberta Grasslands Region to optimize the protection of species at risk and their critical habitat in relation to land use practices.

REGION:
Prairie

TARGET SPECIES:
N/A

WILDLIFE ACT CATEGORY:
N/A

PROVINCIAL GENERAL STATUS:
N/A

Background

The Grasslands Region is one of the most altered ecosystems in Canada. Agricultural development and other human activities have left less than 20 percent of the habitat intact, and conversion to other agricultural uses continues. Most of the land is used for extensive cattle production and is privately owned or is leased as grazing land. In Alberta, 21 of the 30 vertebrate species with a general status of *At Risk*, or *May Be At Risk*, occur in the Grasslands Natural Region. Stewardship by land tenure holders is essential for maintaining populations of species at risk and is recognized as the most desirable approach to species and habitat conservation.

This project is part of an interdisciplinary University of Calgary Masters of Environmental Design degree project, focusing on the subjects of environmental science and law.

Studying two areas with marked differences in land titles and land practices will provide a comparison of the different approaches and stewardship agreements that are necessary to protect species at risk and their critical habitats.

The geographical areas selected are Wildlife Management Units (WMU) 118 and 119, north and south of the Cypress Hills Provincial Park respectively. The land titles of WMU 118 are a mix of leaseholds and private lands and the land practices are intensive. WMU 119 is predominately private land and the main land practice is cattle grazing, an extensive land use practice.

Consensus building is a popular approach to deal with land use planning and management, emphasizing shared decision-making on goals, objectives and actions. Developing a consensus building process will lead to creating innovative solutions to local environmental issues without compromising the livelihood of the landholders.

Methods

There are four main components to the project: statute analysis, stewardship program reviews, participatory rural appraisal and consensus building.

Statute analysis was completed in 2000, and consisted of interpreting the statutes and applying them to landholder issues. The statutes examined were Bill C-33, the proposed federal *Species at Risk Act*; Alberta's *Wildlife Act*; Alberta's *Public Lands Act*; Alberta's *Land Agents Licensing Act*; Alberta's *Environmental Protection and Enhancement Act* and other pertinent legislation.

Stewardship program reviews will consist of evaluating existing stewardship programs in Canada and the United States.

Participatory rural appraisal will be the methodology used to identify all potentially affected individuals, to understand the issues and interests of the affected individuals and to identify the incentives needed to encourage these individuals to develop stewardship agreements.

Results

As an initial step in 2000, the study involved defining existing legislation, regulations and policies that either provide incentives for, or impede, long-term stewardship. A report on these results was submitted to the Fish and Wildlife Division.

Recommendations/Future Direction

In 2001, the statutory review will be supplemented with interviews of selected members of stakeholder organizations to define current issues and stewardship practices. Individual land tenure holders will then be interviewed to define their issues, needs and stewardship practices. The project will define appropriate consensus building approaches that could be used in developing stewardship initiatives for species at risk management. It will propose workable mechanisms or innovative applications that may improve conservation on private and leased lands in southeastern Alberta.

COOPERATING AGENCIES

Canadian Institute of Resources Law (University of Calgary), computing services from Scientia Technologies

For more information contact:

Richard Quinlan *(see page 5)*.

ENDANGERED SPECIES PROTECTIVE NOTATION PROJECT

Project Supervisor: **Richard Quinlan**

REGION:
Prairie

TARGET SPECIES:
Sage Grouse (*Centrocercus urophasianus urophasianus*), **Swift Fox** (*Vulpes velax*), **Peregrine Falcon** (*Falco peregrinus anatum*), **Northern Leopard Frog** (*Rana pipiens*), **Trumpeter Swan** (*Cygnus buccinator*), **Ferruginous Hawk** (*Buteo regalis*), **Burrowing Owl** (*Athene cunicularia*), **Piping Plover** (*Charadrius melodus*), **Prairie Rattlesnake** (*Crotalus viridis*), **Western Blue Flag** (*Iris missouriensis*), **Ord's Kangaroo Rat** (*Dipodomys ordii*) **and other species of concern**

WILDLIFE ACT CATEGORY:
Endangered: Sage Grouse, Swift Fox and Piping Plover

Threatened: Peregrine Falcon, Northern Leopard Frog, Trumpeter Swan, Ferruginous Hawk and Burrowing Owl

Non-game Animals: Prairie Rattlesnake and Ord's Kangaroo Rat

None: Western Blue Flag

(ESCC Recommendation - Endangered: Ord's Kangaroo Rat)
(ESCC Recommendation - Threatened: Western Blue Flag)
(ESCC Recommendation - Data Deficient: Prairie Rattlesnake)

PROVINCIAL GENERAL STATUS:
At Risk: Sage Grouse, Swift Fox, Peregrine Falcon, Northern Leopard Frog, Trumpeter Swan, Ferruginous Hawk, Burrowing Owl, Piping Plover and Western Blue Flag

May Be At Risk: Prairie Rattlesnake and Ord's Kangaroo Rat

purpose

To place protective notations on all known endangered species production sites on public land in the Prairie Region, through the Public Lands referral system.

Background

The need to provide industry with up-front information concerning rare, threatened and endangered species in a particular area was identified by Public Lands Division (PLD) and Fish and Wildlife Division (FWD) staff. Providing this information earlier in the industrial planning process allows FWD staff to better protect critical sites for rare, threatened and endangered species, by giving staff an opportunity to work with the companies towards an agreeable solution. Given this need, it was critical to highlight all known rare, threatened or endangered species production sites on public land using the Public Lands reservation system.

Of highest priority were Protective Notations (PNTs) indicating "no surface access," of 30 acres in size on known endangered species production sites. Once these sites were reserved with this PNT, no industrial development could occur within each localized area.

Reservations on critical production sites and surrounding habitat are necessary for successful endangered species management, as they will immediately flag an area's values and land use guidelines when industry searches for land status.

The objectives of this project were to:

1) Review existing data on rare, threatened and endangered species.
2) Establish criteria for the selection of critical sites for rare, threatened and endangered species.
3) Provide direct protection to the critical sites through the creation of small "no surface access" PNTs.
4) Create buffer zones by creating larger, less restrictive PNTs to help protect the critical habitat of rare, threatened and endangered species.

burrowing owl

Methods

Objectives were addressed through meetings, summarizing data on Geographic Information System (GIS) and the submission of reservation requests to PLD.

Results

In the Prairie Region of Alberta there are approximately 1 214 100 hectares of native prairie on public land. With data points collected from the Biodiversity/Species Observation Database (BSOD), critical areas for rare, threatened and endangered species were mapped using ArcView. The total number of PNT applications using the 470 code (rare and endangered species habitat protection) that will be sent to PLD for the Prairie Region is 296.

As of March 23, 2001, 218 of the PNT applications had been submitted. Sixty-nine of these were approved, a few were rejected and most were still pending a decision. The total area protected to that point was approximately 830 hectares and included nest sites, colonies, breeding ponds, hibernacula, den sites and lek sites. A larger PNT will be implemented around sage grouse leks in the Medicine Hat district, with conditions agreed to in meetings with PLD.

Recommendations/Future Direction

Reservations are important to flag critical habitat for wildlife species. They are an effective tool to restrict land uses to those compatible with natural resources found at a particular site. They should be used as a part of a land use/habitat protection system incorporating other components. A list of these necessary components follows:

1) Regular reviews by the Fish and Wildlife Division of all mineral sale auctions, with resultant identification of potential restrictions to all companies bidding on oil, gas, and coal leases.
2) Pre-development wildlife inventories by oil and gas companies (and other developers) in landscapes where there is a high likelihood of encountering species designated as *At Risk*, *May Be At Risk* or *Sensitive*; this would include native grasslands in the Grasslands Natural Region and potentially other landscapes as well.
3) Industrial guidelines that designate timing constraints and setback distances for species of concern.
4) Updated referral maps, prepared by the Fish and Wildlife Division, and supplied to referral coordinating agencies such as Public Lands, and Lands and Forest Service.
5) Maintenance in the Fish and Wildlife Division offices of a GIS database showing locations of critical habitat for species of concern.
6) Consistent referrals of industrial applications to the Fish and Wildlife Division in areas designated on referral maps, and timely responses back to the coordinating agency.
7) Operation of the inter-agency referral system in a manner which recognizes the roles of both land and resource agencies and adheres to the basic principal of "mutual agreement." This principal requires the referral coordinator to attain agreement from the resource agency (i.e. the Fish and Wildlife Division) for any changes made to submitted conditions.
8) Dedication of staff within the Fish and Wildlife Division to meet the responsibilities of involvement in an effective land use/referral system.

It must be emphasized that the use of PNT reservations should not be perceived as replacing the need for appropriate staffing and involvement in a complete land use/habitat protection process.

In summary, the PNT Reservation Project was moderately successful in placing small "no surface access" PNTs on critical wildlife production sites for species of concern located on public land in the agricultural zone (White Area) of Alberta's Prairie Region; however, landscape-level reservations to protect wildlife were not approved. The need for detailed involvement of the Fish and Wildlife Division staff in a comprehensive and land use/habitat protection program was clearly demonstrated in this project.

COOPERATING AGENCIES

Alberta Agriculture, Food and Rural Development – Public Lands Division

Richard Quinlan *(see page 5)*

PARKLAND REGION NATIVE VEGETATION/LAND USE INVENTORY

Project Supervisor: **Ron Bjorge**

REGION:
Parkland

TARGET SPECIES:
N/A

WILDLIFE ACT CATEGORY:
N/A

PROVINCIAL GENERAL STATUS:
N/A

purpose

To create a vegetation/land use inventory and database for the Parkland Natural Region, indicating location and type of native vegetation.

Background

Native vegetation is defined as an area of unplowed land that is dominated by native plants. It also includes areas of plowed land that have reverted back to native vegetation.

This project provided current location and status information for native vegetation in the Aspen Parkland Natural Region. It also provided data on the number and location of wetlands, and public versus private ownership of land. This in turn provided a basis for land stewardship programs, habitat protection initiatives and related conservation programs.

The objectives of this project were to conduct an inventory of existing vegetation databases, and to complete a native vegetation/land use database in Geographic Information System (GIS) format for at least 10 percent of the Parkland Natural Region. A protocol was established in order to complete the task in the most efficient and accurate manner, and a comprehensive plan was created for completion of the project.

Methods

Existing databases were identified, as was the extent to which they would be useful in addressing project objectives. Through extensive consultation with stakeholders and experts, a protocol was established and a pilot project was conducted on approximately 40 percent of the Parkland Natural Region. A plan for finalizing native vegetation/land use inventory and a database for the Parkland Natural Region was also established.

Results

A finalized process for developing water, vegetation and landowner GIS layers was completed. The creation of water and vegetation layers was completed through a combination of contract and in-house work for certain areas.

The plan for finalizing the project was established, including partnerships between the Alberta Conservation Association, the Nature Conservancy of Canada, Ducks Unlimited, Environment Canada and several others.

Recommendations/Future Direction

The program will be finalized as expediently as possible to ensure that the final product and all data are current.

This initiative is seen as an important step toward maintaining biodiversity in the Parkland Region. The project will provide a habitat database that can be updated and manipulated, and that will be used by resource management agencies in their conservation efforts. The protocol developed for this project will be used as the template for future habitat inventory programs in Alberta and elsewhere.

COOPERATING AGENCIES

Alberta Environment – Resource Data Division, Parks and Protected Areas and Environmental Service; University of Alberta, Ducks Unlimited, Nature Conservancy of Canada, Prairie Farm Rehabilitation Association, Alberta Conservation Association

For more information contact:

David Prescott *(see page 5)*.

THE STATUS OF ALBERTA WILDLIFE DETAILED STATUS REPORTS

Project Supervisor: **Steve Brechtel, Isabelle Michaud** (ACA), **Sherry Feser** (ACA)

REGION:
Provincial (conducted in Headquarters)

TARGET SPECIES:
***At Risk/May Be At Risk* species**

WILDLIFE ACT CATEGORY:
Varied

PROVINCIAL GENERAL STATUS:
Varied

purpose To initiate seven new detailed status reports, and to post recently published reports on the Internet.

Background

Every five years, the Fish and Wildlife Division reviews the status of wild species in Alberta. These overviews, which have been conducted in 1991, 1996 and 2000, assign individual species 'ranks' that reflect the perceived level of risk to populations that occur in the province.

The Alberta Wildlife Status Report series builds on the general status exercise (*The Status of Alberta Wildlife* [1996], *The General Status of Alberta Wild Species 2000* [2001]), and provides comprehensive current summaries of the biological status of selected wildlife species in Alberta.

These detailed status reports compile all current relevant information for a species in a single document. The reports provide important information to the Alberta Endangered Species Conservation Committee and are an invaluable tool for Fish and Wildlife Division staff.

Feedback on the reports produced during the first four years has been positive and enthusiastic. Information contained within these reports has not only aided management decisions, but has raised public awareness of the current status of Alberta's wildlife species.

Methods

Qualified individuals were contracted to prepare the new reports, which then went through an extensive editing process before being printed. In addition, the data sets that resulted from each report were entered into the Biodiversity/ Species Observation Database (BSOD).

Results

Six new reports were initiated in 2000-2001 (prairie falcon, shortjaw cisco, bull trout, Banff Springs snail, wood bison and badger). Final drafts of all reports except for wood bison and badger have been submitted to the editor. Five reports will be printed in the spring/summer of 2001. The report for the shortjaw cisco is on hold until the fall of 2001, when additional information collected over the summer can be added.

A landowner survey was conducted to determine if there was enough available information to write a status report for the long-tailed weasel. The survey did not supply the expected detailed results on the locations and distribution of this species. As a result, the detailed status report on this species was put on hold.

Six reports initiated in the previous fiscal year were printed in 2000-2001 and included: short-eared owl, willow flycatcher, woodland caribou, western spiderwort, bay-breasted warbler and Cape May warbler.

Recommendations/Future Direction

Reports planned for 2001/2002 include the following species:

- brown creeper
- American white pelican
- yucca moth
- white-winged scoter
- northern leopard frog

A data compilation report will be prepared for Franklin's ground squirrel, and number of additional status reports on vascular plants are expected, depending on the results of 2001 field survey.

Cape May warbler

COOPERATING AGENCIES

Alberta Conservation Association

For more information contact:

Robin Gutsell *(see page 5)* and see http://www.gov.ab.ca/env/fw/status/reports/index.html

For copies of the reports, contact: Information Centre 780.422.2079

ALBERTA'S THREATENED WILDLIFE BROCHURES

Project Supervisor: **Steve Brechtel, Isabelle Michaud** (ACA), **Sherry Feser** (ACA)

REGION:
Provincial (conducted in Headquarters)

TARGET SPECIES:
Ord's Kangaroo Rat (*Dipodomys ordii*), **Sage Grouse** (*Centrocercus urophasianus urophasianus*), **Trumpeter Swan** (*Cygnus buccinator*) **and Whooping Crane** (*Grus americana*)

WILDLIFE ACT CATEGORY:
Endangered: Sage Grouse and Whooping Crane

Threatened: Trumpeter Swan

Non-game Animal: Ord's Kangaroo Rat

(ESCC Recommendation - Endangered: Ord's Kangaroo Rat)

PROVINCIAL GENERAL STATUS:
At Risk: Sage Grouse, Whooping Crane and Trumpeter Swan

May Be At Risk: Ord's Kangaroo Rat

COOPERATING AGENCIES

Alberta Conservation Association, Canada Trust Friends of the Environment Foundation, Alberta Sport, Recreation, Parks and Wildlife Foundation, Friends of Elk Island Society, Saskatchewan Environment and Resource Management

For more information contact:

Steve Brechtel *(see page 5)* and http://www.gov.ab.ca/env/fw/threatsp/index.html

For copies of the brochures, contact: Information Centre 780.422.2079

purpose

To update and reprint the whooping crane and trumpeter swan brochures, and to create brochures for sage grouse and Ord's kangaroo rat.

Background

Successful recovery of species at risk depends on public support and understanding of the issue of species decline. One of the key roles of wildlife managers is to provide sound information to the public on the status of wild species, their needs, and the land use and management activities that are either beneficial or detrimental to the maintenance of wildlife populations.

In 1989, Alberta Forestry, Lands and Wildlife initiated a series of informative brochures about certain species at risk in Alberta: the Alberta's Threatened Wildlife Series. These brochures were published in response to the need for public education, which is vital to the recovery of threatened species.

By 1992, 14 brochures were printed and received positive public and professional response. The demand for these brochures became so great that roughly half of the series was out of print by 1997. Furthermore, although the general information contained in the brochures was still accurate, some of the details contained in many of the brochures were outdated.

Six brochures were updated and reprinted in 1998: northern leopard frog, piping plover, peregrine falcon, woodland caribou, western blue flag and burrowing owl. Updating of existing brochures and creation of new brochures continued in 2000-2001.

Methods

Information contained in the Status of Alberta Wildlife detailed status reports is used to write the brochures, and an expert on each species reviews the information to ensure that it is up-to-date and accurate. Each brochure undergoes an extensive editing process before being printed.

Results

In 2000-2001, 4 brochures were completed. They included two updated brochures (trumpeter swan, whooping crane) and two new brochures (sage grouse, Ord's kangaroo rat).

Recommendations/Future Direction

In 2001-2002, two brochures will be updated with new information: woodland caribou and swift fox. A plan to create shorter, summary brochures on species of *Special Concern* and *Data Deficient* species will be initiated. Applications for funding from external sources will be sought to cover the costs of creating and producing this new format.

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definition of terms

Status of Alberta Wild Species Ranks (after *The General Status of Alberta Wild Species 2000 [2001]*)

2000 Rank	1996 Rank	Definitions
At Risk	Red	Any species known to be at risk after formal detailed status assessment and designation as Endangered or Threatened in Alberta.
May Be At Risk	Blue	Any species that may be at risk of extinction or extirpation, and is therefore a candidate for detailed risk assessment.
Sensitive	Yellow	Any species that is not at risk of extinction or extirpation but may require special attention or protection to prevent it from becoming at risk.
Secure	Green	A species that is not at risk or sensitive.
Undetermined	Status Undetermined	Any species where insufficient information, knowledge or data is available to reliably evaluate its general status.
Not Assessed	n/a	Any species whose general status has not been evaluated.
Exotic/Alien	n/a	Any species that has been introduced as a result of human activities.
Extirpated/Extinct	n/a	Any species no longer thought to be present in Alberta (extirpated) or no longer believed to be present anywhere in the world (extinct).
Accidental/Vagrant	n/a	Any species occurring infrequently and unpredictably in Alberta; i.e., outside its usual range.

Alberta's *Wildlife Act*[1]

Endangered Species	A species that is facing imminent extirpation or extinction if limiting factors are not reversed.
Threatened Species	A species likely to become endangered if limiting factors are not reversed.
Species of Special Concern	A species with characteristics that make it particularly sensitive to human activities or natural events.

[1] Draft wording as proposed for the Wildlife Amendment Act

Committee on the Status of Endangered Wildlife in Canada (after COSEWIC 2001)

Extinct	A species that no longer exists.
Extirpated	A species that no longer exists in the wild in Canada, but occurs elsewhere.
Endangered	A species facing imminent extirpation or extinction.
Threatened	A species that is likely to become endangered if limiting factors are not reversed.
Special Concern (Vulnerable)	A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.
Not at Risk	A species that has been evaluated and found to be not at risk.
Data Deficient	A species for which there is insufficient scientific information to support status designation.

related sources

ACA – Alberta Conservation Association
http://www.ab-conservation.com/

COSEWIC
http://www.cosewic.gc.ca/COSEWIC/Default.cfm

Alberta Endangered Species Conservation Committee
http://www.gov.ab.ca/env/fw/riskspecies/index.html

Fish and Wildlife – Alberta Sustainable Resource Development
http://www3.gov.ab.ca/srd/fishwl.html

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http://www.redlist.org/

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http://www.wildspecies.ca/

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No. 3 | Distribution and relative abundance of the shortjaw cisco (*Coregonus zenithicus*) in Alberta, by M. Steinhilber and L. Rhude. (2001)

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No. 5 | 2000 survey of the Trumpeter Swan (*Cygnus buccinator*) in Alberta, by M.L. James and A. James. (2001)

No. 6 | 2000/2001 Brassy Minnow inventory at Musreau Lake and outlet, by T. Ripley. (2001)

No. 7 | Colonial nesting waterbird survey in the Northwest Boreal Region – 2000, by M. Hanneman and M. Heckbert. (2001)

No. 8 | Burrowing owl trend block survey and monitoring - Brooks and Hanna areas, by D. Scobie and R. Russell. (2000)

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